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THE JOURNAL OF LAND & PUBLIC UTILITY ECONOMICS

SOME ECONOMIC ASPECTS OF PUBLIC UTILITY HOLDING COMPANY FINANCIAL STATEMENTS: CONSOLIDATED BALANCE SHEETS

PAUL L. MORRISON

THE SIZE OF RETAIL BUSINESS DISTRICTS IN THE CHICAGO METROPOLITAN REGION

COLEMAN WOODBURY

CAPITAL AND MAINTENANCE EXPENDITURES IN PUBLIC UTILITY ACCOUNTING

JOHN H. BICKLEY

THE RECENT RECESSION OF FARM POPULATION AND FARM LAND

JACOB PERLMAN

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THE JOURNAL OF LAND & PUBLIC UTILITY ECONOMICS

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THE JOURNAL OF LAND & PUBLIC UTILITY ECONOMICS

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SOME ECONOMIC ASPECTS OF PUBLIC UTILITY HOLDING COMPANY FINANCIAL STATEMENTS: CONSOLIDATED BALANCE SHEETS

By PAUL L. MORRISON

IN 1924, public utility holding company groups and interests controlled companies which generated 74.6% of the electric energy generated in the United States.[1] When allowance is made for the large amount of expansion and consolidation which has taken place since 1924,[2] it is safe to assume that substantially more than three-quarters of the electric power industry is now controlled by financial interests which have made use of the holding company device to bring about most of the concentration of control. The gas and telephone industries, and to a less degree the electric railway industry, are likewise dominated by holding companies.

Since holding companies occupy such a prominent place among public utilities, it is important that the financial statements of those companies be so constructed that they can be interpreted accurately, at least by those who are capable of analyzing ordinary statements. Probably the average investor gets relatively little information of value from the financial statements of holding company systems as now prepared, and it may be questioned whether the more technically trained analysts are not seriously handicapped. Where information is not complete, the conservative investment analyst protects himself by refusing to give a favorable opinion and the conservative investor refuses to buy. If this be true, risk is not measured accurately in many instances, with the result that there is assumption of risk with either inadequate or excessive compensation.

An artificially simplified example will illustrate some of the problems involved in financial statement construction and interpretation. In a certain community

[1] *Federal Trade Commission*, "Control of Power Companies," Feb. 21, 1927, p. 40.

[2] *Electrical World*, Annual Progress and Statistical Number published in January of each year, and other current financial publications.

we will assume an electric light and power company with the capital structure shown in Table I.

TABLE I. CAPITAL STRUCTURE OF HYPOTHETICAL COMPANY "A"

5% Bonds	$1,000,000
6% Preferred stock	500,000
Common Stock	500,000
Total	$2,000,000

The company is conservatively capitalized and efficiently operated. Table II shows the condensed income statement.

TABLE II. INCOME STATEMENT OF HYPOTHETICAL COMPANY "A"

Gross revenue	$450,000
Operating expenses, taxes and retirements	290,000
Gross income (8% on $2,000,000)	$160,000
Interest on bonds (5% on $1,000,000)	50,000
Times interest earned	3.2
Net income	$110,000
Dividends on preferred stock (6% on $500,000)	30,000
Times preferred dividend earned	3.67
Balance for common stock	$ 80,000
Return on common stock	16%

In this case the company is earning exactly 8% on the value of its property used and useful in the public service, which value here is the same as the total capitalization.

Three men own all the common stock of Company "A." Since the company is earning 16% on its common stock, these men look around for a way to increase their earnings. The electric company in a neighboring community happens to have identically the same capital structure and is earning substantially the same amount as Company "A." After considerable negotiation with the common stockholders of the neighboring company, which will be referred to as Company "B," those stockholders are induced to accept $750,000 of 6% collateral trust bonds and $250,000 of 7% preferred stock of a new holding company to be formed to acquire all the common stock of the two operating companies. The collateral trust bonds are to be secured by all the common stock of both operating companies. The three stockholders of Company "A" exchange their $500,000 of common stock for $1,000,000 of com-

TABLE III. CONDENSED CONSOLIDATED WORK SHEET OF BALANCE SHEETS OF HYPOTHETICAL COMPANY "H" AND SUBSIDIARY COMPANIES

ASSETS	Company A	Company B	Company H	Inter-Company Eliminations	Consolidated
Property, plant, equipment and other assets	$2,500,000	$2,500,000	.....	.....	$5,000,000
Common stock—					
Company A	.....	.....	$ 500,000	†$ 500,000*	.....
Company B	.....	.....	500,000	† 500,000*	.....
Good-will	.....	.....	1,000,000	‡ 1,000,000*	.....
Totals	$2,500,000	$2,500,000	$2,000,000	$2,000,000*	$5,000,000
LIABILITIES					
Funded Debt	$1,000,000	$1,000,000	$ 750,000	.....	$2,750,000
Preferred Stock	500,000	500,000	250,000	.....	1,250,000
Common Stock	500,000	500,000	1,000,000	†$1,000,000*	1,000,000
Capital Surplus	500,000	500,000	.....	‡ 1,000,000*	.....
Totals	$2,500,000	$2,500,000	$2,000,000	$2,000,000*	$5,000,000

* Deduct.

† Common stock of subsidiaries is owned by the holding company and therefore eliminated from the consolidated statement.

‡ Property, plant and equipment of each of the subsidiary companies was increased $500,000 and capital surplus created for the same amount in order to give the common stock of each of the subsidiaries a book value of $1,000,000 because that amount was paid (in securities) for the common stock by the holding company. On Company "H" statement these increases are represented by good-will, $1,000,000. The elimination noted thus (‡) removes the good-will of the holding company and the capital surpluses of the subsidiaries.

mon stock of the holding company. Thus, without additional investment, these men find themselves in control of another public utility company and their $500,000 now controls $4,000,000 of operating properties. Although the total risk remains the same, a definite shifting of risk has taken place.

TABLE IV. CONSOLIDATED BALANCE SHEET OF HYPOTHETICAL COMPANY "H" AND SUBSIDIARIES

ASSETS		
Property, Plant, Equipment and Other Assets		$5,000,000
LIABILITIES AND NET WORTH		
Funded Debt—		
Company A	$1,000,000	
Company B	1,000,000	
Company H	750,000	$2,750,000
Preferred Stock—		
Company A	$ 500,000	
Company B	500,000	
Company H	250,000	1,250,000
Common Stock—Company H		1,000,000
Total		$5,000,000

Whether or not the risk is over- or under-compensated is one of the important economic aspects of public utility holding companies. Risk may be misjudged to a considerable degree where assets consist principally of equity stocks, as is the case in public utility holding companies, and where the security issued by the holding company is a bond or debenture. It is pertinent to see whether or not the financial statements prepared by the new holding company disclose the facts.

A holding company, Company "H," is formed and auditors are employed to prepare financial statements of the new company. The auditors proceed in the customary manner, making use of a "work sheet" of which Table III is a condensed copy. From the work sheet, the auditors prepare a consolidated balance sheet, Table IV.

Because accounting demands that assets and liabilities "balance," the property accounts of consolidated balance sheets of public utility holding companies generally are the accounts which are adjusted to bring the statement into balance. In the illustration the par value of securities of the holding company issued in payment for the common stocks of Companies "A" and "B" exceeds the book value of the stocks purchased by $1,000,000, so the property account has been increased from $4,000,000 to $5,000,000. The question is not raised whether or not this valuation is excessive. It is the desire, however, that attention be directed to the cosmopolitan character of the property account in consolidated statements and the pressure which may be exerted upon appraisers and accountants in order to "bury" possibly excessive prices paid for subsidiary company securities.

Although the above statement may be technically correct from the standpoint of accounting practice, the real test of a financial statement prepared for investors and owners is the accuracy and completeness of the picture portrayed. The main purpose of a balance sheet is "to portray the financial status of a business at a given moment of time."[3] How accurately is the financial

TABLE V. REVISED CONSOLIDATED BALANCE SHEET OF HYPOTHETICAL COMPANY "H" AND SUBSIDIARIES

ASSETS			
Property, Plant, Equipment and Other Assets of Subsidiary Companies			$5,000,000
Assets of Company "H" other than Securities of Subsidiaries			.....
Total Assets			$5,000,000
LIABILITIES AND NET WORTH			
Capitalization of Subsidiary Companies—			
Funded debt		$2,000,000	
Preferred stock		1,000,000	
Common stock	$1,000,000		
Owned by Company "H"	1,000,000	.....	$3,000,000
Capitalization of Company "H"—			
Funded debt		$ 750,000	
Preferred stock		250,000	
Common stock		1,000,000	$2,000,000
Total liabilities and net worth			$5,000,000

[3] Kohler and Morrison, *Principles of Accounting*, A. W. Shaw Co., Chicago, 1926, p.180.

TABLE VI. BALANCE SHEET OF HYPOTHETICAL COMPANY "H"

ASSETS		
Investment in Common Stocks (at cost)—		
Company "A"		$1,000,000
Company "B"		1,000,000
Total assets		$2,000,000
LIABILITIES AND NET WORTH		
6% Collateral Trust Bonds		$ 750,000
Net Worth—		
Preferred stock	$ 250,000	
Common stock	1,000,000	$1,250,000
Total liabilities and net worth		$2,000,000

status of affairs shown in this consolidated balance sheet?

Let it be assumed for the purpose of illustration that both operating companies fail while these conditions prevail and, in order to illustrate the point, let it be assumed further that each of the properties is sold for $1,750,000. Three and one-half million dollars would then be available for distribution among the security holders. From the balance sheet it might be inferred that the $3,500,000 would be applied to the payment in full of the entire funded debt of the three companies, amounting to $2,750,000, leaving $750,000 as a 60% liquidating dividend to the preferred stock. It is obvious, however, that this

TABLE VII. BALANCE SHEET OF HYPOTHETICAL COMPANY "A"

ASSETS		
Property, Plant, Equipment and Other Assets (at cost)		$2,000,000
LIABILITIES AND NET WORTH		
5% First Mortgage Bonds		$1,000,000
Net Worth—		
Preferred stock	$ 500,000	
Common stock (owned by Co. "H")	500,000	$1,000,000
Total liabilities and net worth		$2,000,000

is not correct, because there are three legal entities rather than one, as might be inferred from the consolidated statement. In fact, there is no company whose financial statement is actually portrayed by the consolidated balance sheet. Practically, the companies may function as a unit and the consolidated statement is presumed to give a picture of the system, but legally, there is no consolidated company. Consequently,

TABLE VIII. PUBLIC SERVICE CORPORATION OF NEW JERSEY AND SUBSIDIARY UTILITY COMPANIES CONSOLIDATED BALANCE SHEET—DECEMBER 31, 1926

ASSETS			
Fixed Capital			$479,894,784.77
Investments			2,338,763.00
Sinking Funds and Other Special Funds—			
Sinking Funds		$ 123,027.95	
Other Special Funds		28,553.49	151,581.44
Miscellaneous Deposits			446,419.47
Current Assets—			
Cash		$ 27,078,023.60	
Marketable Securities		762,968.75	
Notes Receivable		3,600.00	
Accounts Receivable		9,222,147.88	
Interest and Dividends Receivable		23,907.25	
Materials and Supplies		6,253,659.12	
Miscellaneous Current Assets		319,901.13	
Purchasers of Cumulative Preferred Stock of Public Service Corporation of New Jersey under Deferred Payment Plan—			
7% Cumulative Preferred	$ 3,110.00		
6% Cumulative Preferred	1,438,486.00	1,441,596.00	45,105,803.73
Deferred Charges—			
Prepayments		$ 411,886.76	
Unamortized Debt Discount and Expense		3,693,810.45	
Miscellaneous Suspense		1,082,829.85	5,188,527.06
			$533,125,879.47

TABLE VIII (*Continued*). PUBLIC SERVICE CORPORATION OF NEW JERSEY AND SUBSIDIARY UTILITY COMPANIES CONSOLIDATED BALANCE SHEET—DECEMBER 31, 1926

LIABILITIES, CAPITAL STOCK AND SURPLUS			
Long Term Debt—			
Long Term Debt of Public Service Corporation of New Jersey		$ 61,348,025.00	
Long Term Debt of Operating Subsidiaries Controlled through Stock Ownership		90,891,448.86	
Long Term Debt of Lessor Companies Controlled through Stock Ownership		20,110,000.00	
Long Term Debt of Lessor Companies Not Controlled through Stock Ownership		68,033,109.37	
			$240,382,583.23
Current Liabilities—			
Accounts Payable		$ 8,607,339.80	
Consumers' Deposits		3,595,114.50	
Miscellaneous Current Liabilities		81,425.01	
Taxes Accrued		3,043,445.31	
Interest Accrued		2,848,717.20	
Miscellaneous Accrued Liabilities		442,445.40	
			18,618,487.22
Reserves—			
Premiums on Capital Stock		$ 360,500.00	
Retirement Reserve		31,776,151.21	
Contingency Reserve		144,000.00	
Unamortized Premium on Debt		6,940.39	
Casualty and Insurance Reserve		1,925,518.95	
Contributions for Extensions		200,429.05	
Miscellaneous Reserves		2,744,872.73	
			37,158,412.33
Miscellaneous Unadjusted Credits			1,563,229.80
Capital Stock—			
Capital Stock of Public Service Corp. of N. J.;			
Common Stock (3,577,275 shares no par)	$64,910,328.91		
8% Cumulative Preferred Stock	21,531,200.00		
7% Cumulative Preferred Stock	28,904,200.00		
6% Cumulative Preferred Stock	8,756,500.00		
		$124,102,228.91	
Capital Stock of Operating Subsidiaries Controlled through Stock Ownership		30,030,740.00	
Capital Stock of Lessor Companies Controlled through Stock Ownership		6,803,646.67	
Capital Stock of Lessor Companies Not Controlled through Stock Ownership		55,427,405.33	
			216,364,020.91
Sales of Cumulative Preferred Stock of Public Service Corporation of New Jersey Under Deferred Payment Plan—			
7% Cumulative Preferred		$ 5,500.00	
6% Cumulative Preferred		2,054,200.00	
			2,059,700.00
Profit and Loss—Surplus—			
Balance, December 31, 1925		$14,313,127.60	
Net Increase Year Ending December 31, 1926, from Statement of Combined Results of Operations		2,666,318.38	
			16,979,445.98
			$533,125,879.47

the $1,750,000 received from the sale of the assets of each of the operating companies will be applied in the payment in full of both the bonds and the preferred stock and a 50% dividend on the common stock of each operating company. The $500,000 paid on the common stock of the operating companies will accrue to the holding company and will be used as a 66⅔% dividend on the collateral trust bonds of the holding company, which bonds are secured by deposit with the trustees of all of the common stock of both operating com-

panies. Preferred and common stock of the holding company do not receive anything.

The consolidated balance sheet in Table IV, which is a condensed example of the typical public utility holding company consolidated balance sheet, does not make clear the facts which investors and owners are entitled to know. Indeed, an examination of the consolidated balance sheets of practically all the more important public utility holding companies which publish them does not disclose one consolidated statement which makes obvious the relative rights and preferences of the various security holders.

Security holders are entitled to know, at least in a general way, the relative priority of their claims against assets. Can the consolidated balance sheet be revised so that it will disclose the facts, or shall it be discarded as misleading? The consolidated balance sheet is prepared because of recognition of the fact that the group of companies constitutes more or less of an operating and financial unit, but the financial relationships existing between the holding company and its subsidiaries vary radically depending, among several factors, upon the age of the system, the credit of the individual subsidiaries, and the policy of the management. The position of any one company in a system depends on its importance to the system. This is as true of the holding company itself as of any other company. In fact, the holding company can be eliminated in certain instances with little inconvenience to the system, particularly where a holding company has been superimposed on only one operating company, or on another holding company, or where the properties are isolated and no service rendered; but the holding company may be very essential where the system of properties is oper-

TABLE IX. PUBLIC SERVICE CORPORATION OF NEW JERSEY BALANCE SHEET, DECEMBER 31, 1926

Investments—			
Securities of Subsidiary and Leased Companies		$188,865,309.94*	
Other Securities		154,206.67	
Advances to Affiliated Companies		11,565,550.38	
Real Estate		10,887,401.78	
			$211,472,468.77
Reacquired Securities			12,967.24
Sinking Funds and Other Special Funds—			
Sinking Fund of Secured Gold Bonds 6% Series due 1944		$ 422,092.74	
Sinking Fund of Public Service Newark Terminal Railway Company First Mortgage Bonds		289,804.03	
Sinking Fund of Perpetual Interest Bearing Certificates		419,416.77	
Other Special Funds		271,373.23	
			1,402,686.77
Current Assets—			
Cash		$ 3,216,094.13	
Marketable Securities		762,968.75	
Accounts Receivable		233,169.03	
Interest and Dividends Receivable		122,227.49	
Purchasers of Cumulative Preferred Capital Stock under Deferred Payment Plan—			
7% Cumulative Preferred	$ 3,110.00		
6% Cumulative Preferred	1,438,486.00		
		1,441,596.00	5,776,055.40
Deferred Charges—			
Prepayments		$ 12,132.57	
Unamortized Debt Discount and Expense		2,462,532.53	
			2,474,665.10
			$221,138,843.28

TABLE IX (*Continued*). PUBLIC SERVICE CORPORATION OF NEW JERSEY BALANCE SHEET, DECEMBER 31, 1926

LIABILITIES, CAPITAL STOCK AND SURPLUS		
Long Term Debt—		
Perpetual Interest Bearing Certificates	$ 20,111,910.00	
Secured Gold Bonds 6% Series due 1944	20,000,000.00	
Secured Gold Bonds 5½% Series due 1956	15,000,000.00	
Public Service Newark Terminal Railway Company 5% First Mortgage Bonds	5,000,000.00	
5½% Installment Note Payable to Public Service Electric and Gas Company	19,633,771.39	
Real Estate Mortgages	1,417,000.00	
Miscellaneous Notes (payable more than one year from date of issue)	1,832,150.00	
		$ 82,994,831.39
Advances from Other Corporations		134,855.75
Current Liabilities—		
Accounts Payable	$ 5,201,529.00	
Miscellaneous Current Liabilities	1,761.30	
Interest Accrued	1,238,332.09	
Miscellaneous Accrued Liabilities	16,512.73	
		6,458,135.12
Reserves—		
Premiums on Capital Stock	$ 23,000.00	
Retirement Reserve	196,405.64	
Contingency Reserve	144,000.00	
Miscellaneous Reserves	9,860.00	
Miscellaneous Unadjusted Credits	114.53	
		373,380.17
Capital Stock—		
Common Capital Stock (3,577,275 shares)	$ 64,910,328.91	
8% Cumulative Preferred	21,531,200.00	
7% Cumulative Preferred	28,904,200.00	
6% Cumulative Preferred	8,756,500.00	
		124,102,228.91
Sales of Cumulative Preferred Capital Stock Under Deferred Payment Plan—		
7% Cumulative Preferred	$ 5,500.00	
6% Cumulative Preferred	2,054,200.00	
		2,059,700.00
Profit and Loss — Surplus—		
Balance December 31, 1925	$ 3,752,505.11	
Net Income Year Ending December 31, 1926	11,325,159.30	
Total	$ 15,077,664.41	
Deductions from Surplus	23,366.44	
	$ 15,054,297.97	
Less Dividends Paid During Year	10,038,586.03	
Balance, Profit and Loss — Surplus December 31, 1926		5,015,711.94
		$221,138,843.28

* The company states that this amount is made up of:

Subsidiary and leased utility companies	$183,965,099.94
Stock of other subsidiaries (not utilities)	2,000,210.00
Notes of subsidiaries (not in funded debt table)	2,900,000.00
	$188,865,309.94

ated and financed as a unit. Under certain circumstances and under certain managements the entire resources of a utility system will be employed to protect a part of the system, particularly where the investment of the holding company in that part is relatively large, while in other cases certain subsidiaries may be allowed to stand or fall on their own resources or even be "milked" to support the remainder of the system.

A consolidated balance sheet, as suggested above, represents an hypothetical company, and, intentionally or unin-

tentionally, under present technique of construction does not convey a true picture of legal interrelationships, priorities, and rights. But this does not condemn the consolidated balance sheet as useless. In fact, it is an important financial statement and should be prepared by a public utility holding comany, together with balance sheets of all the chief subsidiaries, if the securities of the holding company are to be interpreted properly. This statement is made with full recognition of practical difficulties encountered in preparing a consolidated statement, some of which can be appreciated only by an accountant. For instance, it may be difficult to determine which companies shall be consolidated, particularly if in some cases the proportion of voting stock is less than a legal control but enough for actual control, or where the control is subject to change. Some statements consolidate companies whose voting stock is 100% owned and carry as "Investments" stock less than 100% owned. This procedure may be misleading, particularly if the "Investments" have large amounts of funded debt and preferred stock ahead of them, while the 100% owned companies have relatively little. Likewise, valuation of assets and the propriety of appraisals may be subject to question. But the important part is the capitalization. A holding company generally owns large blocks of equity stocks preceded by prior claims against assets and income. The amount of those claims should be shown and the consolidated balance sheet is one way of doing so.

Granting that a consolidated balance sheet is essential, Table V is submitted, in contrast to Table IV, as a proposed statement which will reflect more ac-

TABLE X. PUBLIC SERVICE CORPORATION OF NEW JERSEY AND SUBSIDIARY UTILITY COMPANIES—PROPOSED CONSOLIDATED BALANCE SHEET, DECEMBER 31, 1926

ASSETS

	AMOUNT	DUE FROM			CONSOLIDATED
		Public Service Corp. of N. J.	Other Companies of the System	Public	
Current Assets:					
Leased and Subsidiary Companies	$ 41,622,217.58†	†	†	†	
Public Service Corp. of N. J.	5,776,055.40	†	†	†	
	$ 47,398,272.98†	†	†	$45,105,803.73	$ 45,105,803.73
Advances to Affiliated Companies:					
Leased and Subsidiary Companies	$ 1,250,000.00	.....	$1,250,000.00	.....	
Public Service Corp. of N. J.	11,565,550.38	.....	11,565,550.38	.....	
	$ 12,815,550.38	.....	$ 12,815,550.38	.....	
Sinking Funds and Other Special Funds	$ 151,581.44	.....	.....	.....	151,581.44
Fixed Capital:					
Leased and Subsidiary Companies	$469,007,382.99	.....	.....	.....	
Public Service Corp. of N. J.	10,887,401.78	.....	.....	.....	
	$479,894,784.77	.....	.....	.....	479,894,784.77
Investments:					
Leased and Subsidiary Companies	$ 184,346.33	.....	.....	$ 184,346.33	
Public Service Corp. of N. J.	189,019,516.61	.....	$186,865,099.94	2,154,416.67	
	$189,203,862.94	.....	$186,865,099.94	$ 2,338,763.00	2,338,763.00
Miscellaneous Deposits	$ 446,419.47	.....	.....	.....	446,419.47
Deferred Charges:					
Leased and Subsidiary Companies	$ 2,713,861.96	.....	.....	.....	
Public Service Corp. of N. J.	2,474,665.10	.....	.....	.....	
	$ 5,188,527.06	.....	.....	.....	5,188,527.06
Total Assets	.....	.....	.....	.....	$533,125,879.47

TABLE X (*Continued*). PUBLIC SERVICE CORPORATION OF NEW JERSEY AND SUBSIDIARY COMPANIES—PROPOSED CONSOLIDATED BALANCE SHEET, DECEMBER 31, 1926

LIABILITIES AND NET WORTH

	AMOUNT	OWNED BY			CONSOLIDATED
		Public Service Corp. of N. J.	Other Companies of the System and Sinking Funds	Public	
Current Liabilities:					
Leased and Subsidiary Companies	†	†	†	$ 12,160,352.10	
Public Service Corp. of N. J.	†	†	†	6,458,135.12	
	†	†	†	$ 18,618,487.22	$ 18,618,487.22
Deferred and Unadjusted Credits:					
Leased and Subsidiary Companies	$ 6,431,016.39	.....	.....	.....	
Public Service Corp. of N. J.	9,974.53	.....	.....	.....	
	$ 6,440,990.92	.....	.....	.....	6,440,990.92
Capitalization of Leased and Subsidiary Companies (Schedule A):					
Long-Term Debt	$208,328,958.23	$ 10,867,000.00	$ 18,427,400.00	$179,034,558.23	
Preferred Stock	57,196,800.00	19,979,833.33	.....	37,216,966.67	
Common Stock	219,966,506.00	163,297,850.00	1,623,830.67	55,044,825.33	
	$485,492,264.23	$194,144,683.33	$ 20,051,230.67	$271,296,350.23	271,296,350.23
Capitalization of Public Service Corporation of N. J.:					
Long-Term Debt	$ 82,994,831.39	$ 12,917.00	$ 21,633,889.39	$ 61,348,025.00	
Preferred Stock	61,251,600.00*	.....	.....	61,251,600.00	
Common Stock	64,910,328.91	.....	.....	64,910,328.91	
	$209,156,760.30	$ 12,917.00	$ 21,633,889.39	$187,509,953.91	187,509,953.91
Total Capitalization of All Companies	$694,649,024.53	$194,157,600.33	$ 41,685,120.06	$458,806,304.14	
Surplus:					
Leased and Subsidiary Companies —Balance, December 31, 1925	$ 10,560,622.49	.....	.....	.....	
Net Increase Year Ending December 31, 1926	1,403,111.55	.....	.....	.....	
	$ 11,963,734.04	.....	.....	.....	
Public Service Corp. of N. J.— Balance, December 31, 1925	$ 3,752,505.11	.....	.....	.....	
Net Increase Year Ending December 31, 1926	1,263,206.83	.....	.....	.....	
	$ 5,015,711.94	.....	.....	.....	
Premiums on Capital Stock	$ 360,500.00	.....	.....	.....	
Contingent Reserve	$ 144,000.00	.....	.....	.....	
	$ 17,483,945.98	.....	.....	.....	17,483,945.98
Retirement Reserve	$ 31,776,151.21	.....	.....	.....	31,776,151.21
Total Liabilities and Net Worth	.....	.....	.....	.....	$533,125,879.47

* Includes $2,059,700 subscribed of which $1,441,596 is unpaid.
† Information not available.

curately the intercorporate relationships and priorities. The principal change is in placing the various elements of the capitalization in the order of priority, at least in a general way, realizing that the assets of the subsidiaries are combined and the equities of the various security holders of similar priority in those assets are also consolidated. It is not the intention to suggest that the preferred stock of one subsidiary necessarily has a claim prior to common stock of another subsidiary. The purpose of the consolidated statement is to help analyze the securities of the holding company itself rather than the securities of the subsidiaries. Therefore, claims prior to those of the holding company

should be clearly set forth but of necessity must be grouped to prevent the statement from becoming unwieldy.

But a consolidated balance sheet alone is not sufficient. A separate balance sheet is needed for the holding company itself and for each of the subsidiaries and a statement is needed of all securities which are intercompany-owned, if that fact is not portrayed clearly by the various statements. The balance sheet of "Company H and Subsidiaries," shown in Table IV, could have been interpreted much better if a balance sheet of the holding company and of each of the subsidiaries had accompanied it. The series of condensed balance sheets in Tables V, VI, and VII portray the simple financial relationships existing in the illustration. The balance sheet of Company "B" is a duplicate of that of Company "A."

The objection may be made that the proposed type of statement is applicable only to simple cases. In order to test its application to a more complex situation, a search was made for a company which publishes sufficient information to make the experiment possible. Practically the only eligible company was the Public Service Corporation of New Jersey.[4] The legal and financial structure of that company is not complicated by subsidiary holding companies, but it does have three kinds of companies which it combines in its consolidated statements, (1) subsidiary companies controlled through stock ownership, (2) leased companies controlled through stock ownership, and (3) leased companies not controlled through stock ownership. The Public Service System is one of the large utility systems, total assets exceeding $500,000,000, with its revenue being derived, in 1926, from the following sources:

Electricity	44.17%
Transportation	31.10
Gas	24.73
	100.00%

Unfortunately this company is not quite as effective an illustration as some other companies might be because the system serves contiguous territory which is relatively densely populated and the system is operated and financed almost as if it were one company. Under these circumstances priority of equities of security holders is not quite as important as in certain other cases. Nevertheless, legal priorities and interrelationships are present and the situation is complicated somewhat by the existence of a large number of leases.

The consolidated balance sheet of the Public Service Corporation of New Jersey and subsidiaries appears in Table VIII and the balance sheet of the Public Service Corporation of New Jersey itself appears in Table IX, both as of December 31, 1926. In the annual report, consolidated balance sheets of the two principal subsidiary operating-and-holding companies, Public Service Electric and Gas Company and Public Service Railway Company, follow. These, in turn, are supplemented by a detailed statement of each issue of funded debt and stock of each company in the sys-

[4] Standard Gas and Electric Company data are almost complete enough for this purpose.

When the original data, compiled from pages 35 to 46, inclusive, of the 1926 Annual Report of Public Service Corporation of New Jersey, were submitted to officers of that company for verification, it developed that the information about the intercompany holdings of funded debt and capital stock of the companies of the system was not fully indicated. The revised figures showed that the holding company owned more funded debt and capital stock of subsidiary companies than the original compilation had disclosed. This part of the Annual Report of the company would be improved by the addition of a few more symbols so that no confusion would exist in the mind of the reader.

The writer wishes to take this opportunity to acknowledge the cooperation of Mr. P. S. Young, Vice-President of the Public Service Corporation of New Jersey.

TABLE XI. SCHEDULE A—PUBLIC SERVICE CORPORATION OF NEW JERSEY AND SUBSIDIARY UTILITY COMPANIES

CAPITALIZATION OF LEASED AND SUBSIDIARY COMPANIES
DECEMBER 31, 1926

	Amount	Owned by			Consolidated
		Public Service Corp. of N. J.	Other Companies of the System and Sinking Funds	Public	
Long-Term Debt:					
Leased Companies Not Controlled through Stock Ownership	$ 76,289,509.37	$ 1,076,000.00	$ 7,180,400.00	$ 68,033,109.37	.....
Leased Companies Controlled through Stock Ownership	20,469,000.00	83,000.00	276,000.00	20,110,000.00	.....
Operating Subsidiaries Controlled through Stock Ownership	111,570,448.86	9,708,000.00	10,971,000.00	90,891,448.86	.....
	$208,328,958.23	$ 10,867,000.00	$18,427,400.00	$179,034,558.23	$179,034,558.23
Preferred Stock:					
Leased Companies Not Controlled through Stock Ownership	$ 446,800.00	.....	.....	$ 446,800.00	.....
Leased Companies Controlled through Stock Ownership	6,750,000.00	4,633.33	.....	6,745,366.67	.....
Operating Subsidiaries Controlled through Stock Ownership	50,000,000.00	19,975,200.00	.....	30,024,800.00	.....
	$ 57,196,800.00	$ 19,979,833.33	.....	37,216,966.67	37,216,966.67
Common Stock:					
Leased Companies Not Controlled through Stock Ownership	$ 55,817,016.00	$ 12,300.00	$ 824,110.67	$ 54,980,605.33	.....
Leased Companies Controlled through Stock Ownership	6,551,990.00	6,441,790.00	51,920.00	58,280.00	.....
Operating Subsidiaries Controlled through Stock Ownership	157,597,500.00	156,843,760.00	747,800.00	5,940.00	.....
	$219,966,506.00	$163,297,850.00	$ 1,623,830.67	$ 55,044,825.33	55,044,825.33
Total Capitalization of Leased and Subsidiary Companies	$485,492,264.23	$194,144,683.33	$20,051,230.67	$271,296,350.23	$271,296,350.23

tem showing (1) amount authorized, (2) amount outstanding, (3) intercompany[5] and sinking fund holdings, and (4) amount in the hands of the public. The company is to be commended for its complete statement of facts.

Although the information is available in the annual report of the company,[5] considerable study is required on the part of an analyst to ascertain what securities rank ahead of any specific issue of the holding company and also what amounts of those prior claims are owned by the holding company. The balance sheets are not designed to portray the information which has been assumed in this discussion to be important. In fact, the only guiding principle in determining the order of items appears to be to place fixed capital and long-term debt first among the assets and liabilities, respectively, and capital stock and surplus last among the liabilities. Long-term debt and capital stock of the holding company itself are placed first in their respective classifications on the consolidated balance sheet, thus specifically ignoring the order of priority. These or similar criticisms apply to practically all public utility holding company statements and are not made with the intention of singling out the Public Service System for criticism.

In Table X, supported by Schedule A (Table XI), an attempt is made to apply the principles evolved in the early part of this discussion to the consolidated balance sheet. The purpose is to leave the analyst with a general idea of the structure of the system so he can measure more accurately, in conjunction with the information contained in the

[5] See comments in n. 4, *supra*.

income accounts, the risk involved and the compensation therefor.

Many security holders and prospective security holders will get no more information from Table X than from Table VIII, but the person who can read financial statements should have a clearer understanding of the financial relationships. The liability side of the statement has been condensed by using merely the total long-term debt, preferred stock, and common stock of leased and subsidiary companies, but Table XI shows these in greater detail. This schedule is particularly important because of the presence of leased companies not controlled through stock ownership.

Table X shows intercompany holdings of securities. It indicates that the holding company owns $10,867,000 of bonds of the leased and subsidiary companies, $19,979,833 of preferred stock, and $163,297,850 common stock. This total of $194,144,683 is carried at $183,965,-099.94 by the holding company itself, according to the "Investments" in Table X and also in Table IX. The holding company thus owns principally junior equity securities. Its own bonds and stock should be interpreted accordingly in conjunction with all other factors considered.

The proposed statement in Table X has embodied the following principles in a general way:

1. Assets have been arranged in the general order of liquidity; that is, in the order in which, during the ordinary course of operations, they will be converted into cash.
2. Liabilities have been arranged in the general order of priority in the ordinary course of operations, with a certain amount of unavoidable overlapping, resulting from such situations as the ownership of almost $20,000,000 of preferred stock by the holding company and the liability of the holding company to a subsidiary for over $19,600,000.

The order in which the items have been placed in Table X is merely suggestive and therefore subject to deserved criticism. The purpose is to illustrate principles. The reclassification of "Reserves" has been arbitrary because of a lack of information about the various accounts. The location of the retirement reserve, in particular, is quite arbitrary and involves the whole theory of retirements and depreciation which is not raised here.

Political elements of the public utility problem are becoming important along with the economic phases and practical expediency may tend to modify the suggestions made above, which are based on the assumption that complete information is desirable and even essential in ascertaining the risk involved and the compensation therefor.

Although the form of consolidated balance sheet which has tentatively been proposed appears to be more complicated than the customary form, a simple statement is of little value if the desired facts are not ascertainable therefrom. In fact, the more complex form emphasizes the existence of interrelationships which need to be investigated.

LAND TENURE IN WALNUT GROVE TOWNSHIP, KNOX COUNTY, ILLINOIS

By WILLIAM TEN HAKEN

TO a great many people the term "land tenure" suggests the renting of land by a tenant from an owner. This mistaken concept is probably due to the unfortunate resemblance between the words "tenure" and "tenancy." Land tenure, according to English law, is the act or right of holding land, also the manner of holding land, of a superior. The term is used in this paper in the latter sense, except for the necessary modification, to make it applicable to American conditions, that land is not held "of a superior" in this country. The particular type of tenure, or mode of holding land, is determined by the conditions surrounding the holding.

The classes of land tenure most common in the United States are fee simple, estate for life, leasehold, land contract, and easement. Of these, fee simple and leasehold have by far the most practical significance. In fact, holding of land by fee simple, since it is the largest possible estate in land known to law, constitutes the heart of the land tenure concept. All of the minor estates may be said to be carved out of the fee, thus rendering it less valuable to the holder. The leasehold is second in importance, by virtue of the fact that division of the fee in this country usually takes the form of vesting the right of use and possession of the land temporarily in another person in return for a consideration.

It is with these two types of land tenure, the holding of land by fee simple, and by lease, commonly known as ownership and tenancy, that this study is primarily concerned. Attention is called to the two principal meanings attached to the terms ownership and tenancy. When the percentages of these two forms of land tenure in a certain political unit are discussed, either the number of owner-operators and tenant-operators is referred to, or the amounts of land operated by owners and tenants, for, obviously, tenancy must exist side by side with ownership, since the land which is rented is also owned by some one. In other words, the two kinds of tenure are co-existent and complementary, as modes of holding land, but distinct and mutually exclusive, as types of operation.

Much has been said and written during recent years upon the subject popularly known as "the agricultural ladder." The "agricultural ladder" contains a number of rungs which represent certain well-defined stages through which a young man may pass in his ascent from the status of apprentice on his father's farm to that of owner of a farm of his own. Some attain the ownership of land without passing through any of the stages which usually intervene between that of farm boy and land owner, and some pass through all the possible stages, including working in another occupation. The vast majority, however, do not become landowners without spending some time on one or more rungs of the "ladder."

Many attempts have been made to ascertain under what circumstances it is possible for a young man, not blessed (or cursed) with an inheritance, to ad-

vance step by step to the unencumbered ownership of an average-sized American farm. Some of these discussions have been purely theoretical; others have been based on gathered facts. The purpose of this study was not to answer the question suggested, but to collect additional data from a selected area in western Illinois which might serve as a basis for further discussion.

Selection of the Area

Several considerations influenced the selection of the area to be studied. In the first place, an area was desired which was typical of that portion of the Corn Belt which is devoted largely to the raising of corn and live stock. Similar studies from slightly different angles were being planned of a township in Champaign County, Illinois, and another in Manitowoc County, Wisconsin. The former is in the heart of that part of the Corn Belt where corn is raised principally as a cash crop, and where the percentage of tenancy was 60.3% in 1925, according to the Census of Agriculture Reports. The renting of land was also predominantly on a commercial basis. The study in Wisconsin was made in that section where the dairy industry is the prevalent type of agriculture, and where only 4.1% of the farms were operated by tenants in 1925, almost all of which were rented from relatives. Knox County, Illinois, is typical of a corn-raising area where much of the corn is marketed in the form of hogs and beef cattle. In this county a little less than half of the farms, 46.4%, were rented by the operators in 1925, largely from relatives also. Thus three areas, within a radius of 200 miles of Chicago, widely divergent in the character and percentage of their tenancy, but each typical of a rather well recognized and important type of agriculture, became the objects of intensive land tenure studies during the year of 1926.[1]

Description of the Area

Knox County is located in that portion of Illinois known as the Military Tract, which includes all the land between the Illinois and Mississippi Rivers, south of the northern boundary line of Bureau and Henry Counties. This area was so-named because it was set aside by the Federal Government for the

[1] The more significant facts uncovered in the other Illinois study were contained in an article published in the August, 1927 issue of the *Journal of Land and Public Utility Economics*, while a preliminary report of the Wisconsin study appeared in the November number.

soldiers of the War of 1812, to be patented to them in quarter-sections. Soldiers of other wars were also granted land in Knox County, however, as is shown by the original grants from the United States Government. Geographically the county is bounded by Henry County on the north, Stark and Peoria on the east, Fulton on the south, and Warren and Mercer counties on the west.

Considering the location of the county from the geological point of view, it lies in the upper Illinois glaciation and is located on the crest of the divide between the Mississippi and Illinois Rivers. Approximately the northwest quarter of the county drains directly into the Mississippi, while the rest is drained chiefly by the Spoon River into the Illinois. The highest point in the county is 859 feet above sea level, although the average elevation is only 725 feet.

Most of the county is undulating prairie, but there were also originally many large groves of fine timber, especially in the southern and southeastern portions. The original timber consisted of several varieties of oak, elm, ash, hickory, black walnut, and maple. The soil is, for the most part, dark, rich, vegetable loam. The entire surface of the uplands was completely buried by the Illinois glacier under a thick layer of drift, the depth of which averages about 30 feet. It is made up of strata of yellow and blue clay, which is mixed with sand and gravel in some instances. Alluvial deposits are rather small, generally much less than a mile in width, and form the bottom lands along the streams.

Historical Background

It is not necessary to give an exhaustive account of the early political jurisdictions under which the area now comprising Knox County was governed. On January 13, 1825, Knox County was established by an act of the Legislature and its boundaries were determined the following year, although it was still attached to Fulton County for judicial and recording purposes. In July, 1830, occurred the formal organization of the county as it is at present, except that two townships were included which, upon organization of Stark County in 1837, were separated from Knox and made a part of the new county. Barely 300 legal voters were living within the boundaries of the county at that time, which was the number required by law before it could be organized as such.

The first settlers came in 1828, three years after Knox County was established by the Legislature. They were two brothers from Scotland, who originally settled in Henderson Township, where Knox County was first cultivated by a white man. One of the brothers had considerable difficulty in obtaining legal possession of the land he had originally settled upon, as had many of the pioneers, because of tax titles, grants, patents, etc., of the land, which were held by other people. Immigrants simply entered government lands, "squatted" on "patent" or military lands, and put up improvements on them, thus making them "valuable." In many instances, the original patent would be presented at this stage by some one who would evict the squatter and take possession, frequently failing to pay the occupant anything for his improvements. This condition of affairs furnished a most fertile field of operation for a certain class of men called "land sharks," who came into this section of Illinois to work up cases, presumably for the original patentees, but in reality for themselves.

The population increased rapidly. In 1830 three families settled in Lynn Township on the edge of a grove, which

became known as Fraker's Grove, named after one of them, an Irish immigrant. These were the first white settlers in the northeastern part of the county. The first Swedish settlers in Knox County came to Victoria Township in 1838. Not until 1845, however, did the immigrants begin to arrive in numbers. In that year one of the first large colonies was established in Bishop Hill in Henry County, a short distance across the line to the north. The Germans were probably next in importance to the Scotch, Swedish and Irish among the foreign-born settlers during those early days in Knox County. However, very few Germans came to Walnut Grove Township. Even Galesburg seems to have had no such attraction for this nationality as had Davenport, Rock Island, Quincy, and Burlington.

Emigrants from other states of the Union made up a considerable proportion of the population from the year of the first settlement. Until the Black Hawk War (1832) the settlers came mainly from the states of Kentucky, Tennessee, and Virginia, or from temporary homes in southern Illinois and Indiana. But in 1836 immigration from eastern states started in earnest and southern immigration began to decline. The majority of these later immigrants came from New England, New York, Pennsylvania, and Ohio.

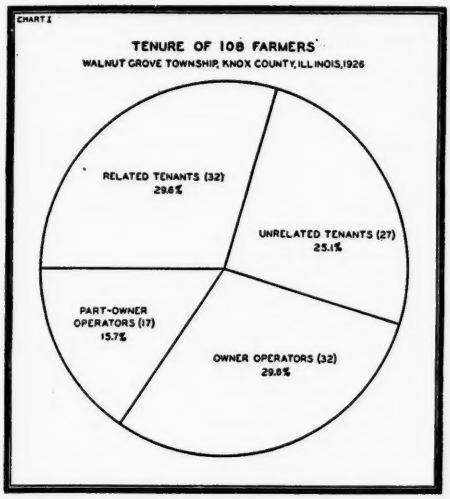
These early settlers almost without exception selected the sites for their new homes in the timber or along its margin. Always having lived in the shelter of trees, it is not surprising that they should settle similarly in a new country. The trees furnished not only the material out of which they built their cabins, but also furnished protection from the severe storms, which the hastily built and poorly furnished homes were ill fitted to withstand. The timber also provided a convenient supply of fuel for their stoves, as well as temporary shelter for the stock, until sheds and other outbuildings could be built.[2]

Method of Procedure

The method of investigation used in this study is the intensive consideration of a relatively small number of cases, rather than a more or less superficial survey of a large number of cases. Such a system has the advantage of a much closer approach to accuracy of facts, but the number of cases is so small as to render statistical and graphical presentation of the data somewhat misleading on the face. Therefore, the qualitative, rather than the quantitative aspects of the data secured will be emphasized. The reader should bear in mind this fact, especially in the interpretation of percentages.

The most important preliminary step in the study, prior to the actual field work in the township selected, was to obtain a complete list of transfers for the entire township from the time the land was first taken up. Section 16 was omitted from the study because it is almost entirely occupied by the village of Altona, and Section 21, adjoining it on the south, has also been divided into an unusually large number of smaller parcels which made the listing of transfers extremely difficult. The other 34

[2] The above description necessarily applies to the whole of Knox County, because most of the available information from secondary sources relates to counties rather than to individual townships in a county. The choice of Walnut Grove Township from the twenty townships in Knox County was primarily a matter of expediency and convenience. The village of Altona, situated approximately in the center of the township, seemed to offer an ideal headquarters from which to conduct the sort of field study which was contemplated. It furnished direct rail connections with Chicago, and with Galesburg, the county seat. The latter feature was especially desirable because of necessary preliminary work to be done on the county records.

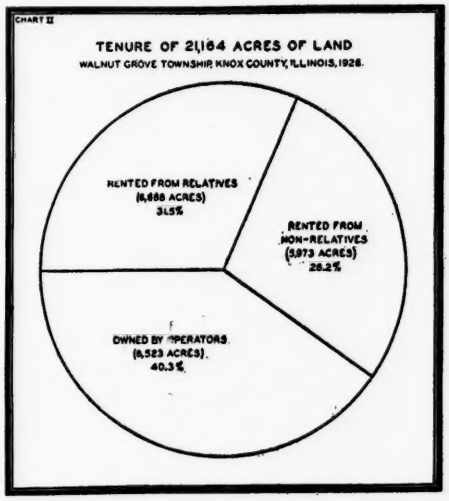


sections were considered capable of furnishing just as true a picture of the land tenure conditions in Knox County, as the entire 36 sections in the township could have done.

The field work proper consisted principally of personal interviews with former or present owners of land in the township who are now retired, and with present operators, both owners and tenants. A schedule containing questions concerning each successive stage in the life of the person interviewed, or each rung in his "agricultural ladder," was used for recording the information. A total of 108 farm operators, 31 retired farmers, and 2 non-agricultural landowners in Walnut Grove Township were interviewed for the purpose of obtaining the specific data called for in the questionnaire. Much additional valuable information of a general nature was obtained from other inhabitants of Altona. The two non-agricultural owners of land, a retired butcher and a retired merchant, neither one of whom has ever been engaged in agricultural work of any sort have been disregarded so far as this study of the "agricultural ladder" is concerned.

Percentage of Ownership and Tenancy

As was previously suggested, when ownership and tenancy are mentioned together, reference is had either to the number of operators who own their own land, as compared with the number who rent theirs, or to the numbers of acres operated by owners and tenants respectively. For reasons which will appear during the course of this article owners are divided into two classes, owner-operators and part-owner-operators. An owner-operator is one who has title to all of the land which he operates, while a part-owner-operator rents from another some of the land which he operates. Tenants are also divided into related and unrelated tenants. A related tenant rents all, or the greater part, of the land which he operates from a relative, usually his father or father-in-law. An unrelated tenant rents all, or the greater part, of the land which he operates from a person not related to him.



The relative importance of the four types of land tenure is shown by Chart I. Considering owners and tenants together the percentage of tenancy to the total number of farmers, 54.7% for Walnut Grove Township, compares with 46.4% for Knox County, and 42% for Illinois as a whole, according to the 1925 Reports of the Census of Agriculture. Considering only those in the tenant group, 32.8% of the tenants in Knox County, and 31.4% of the tenants in the entire state, were related to their landlords in 1925, whereas in Walnut Grove Township 54.2% of the tenants are related to the owners.

Chart II shows the relative importance of the four types of tenure from the point of view of the number of acres operated by each. The total number of acres operated by farmers living within the area is slightly less than the total number of acres operated in the township. Considering only the area operated by farmers living within the township, 30% of the acreage is operated by owners, 17.8% by part-owners, 27.8% by related tenants, and 24.4% by unrelated tenants. This slight discrepancy in acreage is explained by the fact that some of the land near the edge of the township is operated by farmers living in adjoining townships, while some farmers living near the township line operate some land across the line.

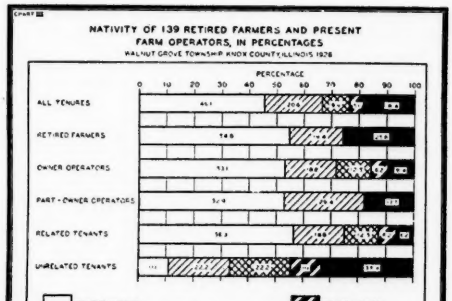
TABLE I. NATIVITY OF FARMERS IN DIFFERENT CLASSES OF TENURE IN WALNUT GROVE TOWNSHIP, KNOX COUNTY, ILLINOIS

Class of Tenure	Place of Birth				
	Walnut Grove Township	Other Townships in Knox County	Other Counties in Illinois	Other States	Other Countries
All Classes.....	64*	29	14	7	25†
Retired Farmers...	17	6	.....	.....	8
Owner-Operators..	17	6	4	2	3
Part-Owner-Operators.....	9	5	.....	.....	3
Related Tenants ..	18	6	4	2	2
Unrelated Tenants.	3	6	6	3	9

*One of the non-agricultural owners was born in the township.
†The other non-agricultural owner was born abroad.

Nativity of Operators and Retired Farmers

An interesting phase of the land tenure picture in the township is the nativity of past and present operators by classes of tenure. The following well-defined political units are used in the classification of nativity: home township, other townships in Knox County, other counties in Illinois, other states, and other countries.



With the exception of the unrelated tenant class, approximately three-fourths of all members of each tenure class were born in Knox County, and more than one-half in the home township, as shown on Chart III. The absolute figures are shown in Table I, from which the percentages on Chart III are computed. Two or three items in this table deserve special notice. All of the retired farmers and all of the part-owners were born either in Knox county or in a foreign country. On the other hand, the highest percentage of men born in the home township is found, as would be expected, in the related tenant class, while the unrelated tenants represent the largest percentage of foreign-born. The relative

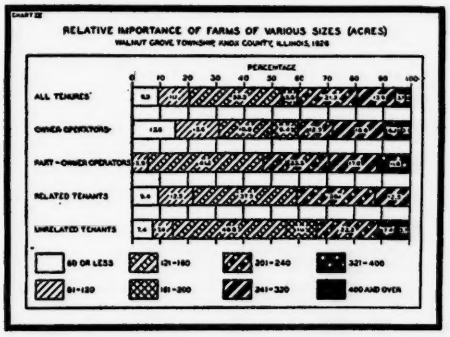
stability of the population in this region is shown by the fact that about 75% of each class, except the unrelated tenants, were born in Knox County and over 50% in the township itself. Of the 141 owners, operators, and former operators interviewed, 65 were born in the home township, 29 in other townships in Knox County, 14 in other counties in Illinois, 7 in other states, and 26 in foreign countries. Of the foreign-born, 22 were born in Sweden, 2 in Scotland, and 2 in England. One of the non-agricultural owners of land was born in Sweden; the other in the township itself.

The movement from farm to city, which has taken place more rapidly during the recent years of agricultural depression, has been "viewed with alarm" by people not conversant with the real problems of agriculture. No facts have been obtained in this study in any organized form which might indicate the extent of such movement in the past. But some light may be thrown upon the existence of a movement in the opposite direction, by the answers given to the question whether the present operator was born on a farm. Table II, which tabulates these answers, seems to indicate that a relatively small percentage of present and past farm operators were drawn from the city, although the counter-movement from city to farm

TABLE II. PROPORTION OF FARMERS IN VARIOUS TENURE GROUPS WHO WERE BORN ON FARMS, WALNUT GROVE TOWNSHIP, KNOX COUNTY, ILLINOIS

CLASS OF TENURE	BORN ON FARM	
	Number	Per Cent.
All Classes	128*	88.0
Retired Farmers	26	83.9
Owner-Operators	31	96.9
Part-Owner-Operators	15	88.2
Related Tenants	31	96.9
Unrelated Tenants	21	77.8

*The two non-agricultural owners were not born on farms

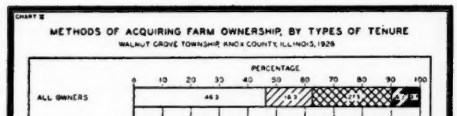


does tend to offset the much feared migration from country to city.

Relative Importance of Farms of Various Sizes

The average size of farms among the 108 studied is 195 acres. The owner-operator's farm contains 197 acres on the average; the part-owner-operator's, 217 acres; the related tenant's, 183 acres; and the unrelated tenant's, 190 acres. A comparison of the relative importance of farms of various sizes in each class of tenure can be made from Chart IV. There are 10 farms of 80 acres, the smallest size found; 12 from 81–120 acres; 36 from 121–160 acres; 6 from 161–200 acres; 23 from 201–240 acres; 15 from 241–320 acres; 4 from 321–400 acres; and only 2 over 400 acres. It will be observed that the modal size is 121–160 acres. There are 2 farms of 200 acres; 2 of 400 acres; 1 of 440 acres; and 1 of 520 acres. All but 38 farms, distributed among the various groups, have even numbers of acres; that is, multiples of 40, one-sixteenth of a section.

The economic unit for a farm in this township seems to be 160 acres. The operation of a quarter-section generally allows for the use of a complete set of farm machinery and the hiring of one man for nine months or the entire year. On farms below this convenient size,



the operator usually attempts to get along without hiring a man regularly, or he may diversify operations sufficiently to require the full-time services of an assistant. The farmer who operates more than 160 acres encounters no such labor problem, since he can add hired help in installments according to his needs.

Owner-operators, as distinguished from tenants, tend to have the smallest and the largest farms. Of the 6 farms of more than 320 acres only 1 is operated by a tenant, while of the 10 smallest farms 5 are operated by owners and 5 by tenants. The 12 farms of the next larger class are also equally divided between owners and tenants, but in the modal class the tenant-operated farms outnumber the owner-operated about two to one. There is again an equal division in the rather small 161–200 acre class, but in the 241–320 acre class the proportion is about three to two in favor of farms cultivated by owners. Allowance must be made for the fact that while all told there are 49 farms operated by owners in whole and in part, there are 59 operated by tenants.

It is significant that more than 90% of the farms of owner-operators are distributed fairly uniformly among the first six size-classes, with the exception of the odd-sized 161–200 acre group, while in the case of each one of the other three kinds of tenure, two or three sizes predominate within a range of 121–320 acres. Approximately 40% of the farms in each of these three tenure classes are between 121 and 160 acres in size, and about 25% are between 201 and 240 acres.

Steps in Achieving Ownership and Methods of Acquiring Owhership

In a study of the "agricultural ladder" in a given community, it is important to discover to what extent the ownership of land has been attained through means other than climbing up each successive rung. Two aspects of this phase of the study present themselves. One is concerned with the particular kind of transfer by means of which farmers become owners of land. The five most common methods of ac-

TABLE III. COMBINATIONS OF STAGES BY WHICH 139 FARMERS REACHED THEIR PRESENT TENURE STATUS, WALNUT GROVE TOWNSHIP, KNOX COUNTY, ILLINOIS

Combinations of Stages	All Tenures	Retired Farmers	Owner-Operators	Part-Owner-Operators	Related Tenants	Unrelated Tenants
All	139	31	32	17	32	27
FLWHTO*	1	1	.....	.....	.....	.....
FLWTO	1	1	.....	.....	.....	.....
FLHTO	3	1	2	.....	.....	.....
FLTO	4	1	2	1	.....	.....
FLHO	1	1	.....	.....	.....	.....
FWHTO	1	.....	1	.....	.....	.....
FWTO	20	7	8	5	.....	.....
FHTO	11	2	4	5	.....	.....
FWHO	1	.....	1	.....	.....	.....
FWO	2	2	.....	.....	.....	.....
FHO	1	.....	1	.....	.....	.....
FTO	26	9	13	4	.....	.....
LHTO	2	1	.....	1	.....	.....
LTO	2	1	.....	1	.....	.....
HTO	1	1	.....	.....	.....	.....
FO	3	3	.....	.....	.....	.....
FLWHT	1	.....	.....	.....	.....	1
FLWT	1	.....	.....	.....	1	.....
FLHT	8	.....	.....	.....	4	4
FLT	2	.....	.....	.....	2	.....
FWHT	4	.....	.....	.....	2	2
FWT	12	.....	.....	.....	9	3
FHT	12	.....	.....	.....	2	10
FT	14	.....	.....	.....	12	2
LHT	3	.....	.....	.....	.....	3
HT	2	.....	.....	.....	.....	2

*Symbols: F—Apprenticeship; farm boy works on home farm without wages.
W—Hired laborer at home stage; works on home farm.
H—Hired laborer stage; works away from home farm.
L—Other occupation stage; non-farming work.
T—Tenant stage.
O—Owner stage.

quiring land ownership and their relative importance to each of the three classes of owners are shown on Chart V. The other aspect is found in the stages through which farmers pass before becoming owners. Very few pass through all the possible stages, and those who omit one or more pass through various combinations. Table III shows the number of landowners who spent some time in the different tenure stages, as well as of tenants who have not yet completed the climb up the "ladder."

For the sake of brevity and convenience, a single letter is used to designate each one of these stages. (See footnote to Table III). These are for the most part the same symbols which have been used in other studies[3] of steps to farm ownership, except that here the hired-laborer-at-home stage (W) and the hired-laborer-away-from home stage (H) are differentiated, while usually both are included under H. A combination of the letters indicates not only the stages through which owners have passed, but also the order in which they pass through them. For example, the FWTO group consists of all those who were brought up on a farm, worked at home with wages, and became tenants, before finally attaining ownership. Similarly, the FO group includes those who have never worked for wages, nor operated land as tenants, prior to the acquisition of land in their own right. If L occurs as the first stage, the indication is that boyhood was spent in a town or city, not on a farm.

The FTO "ladder" was climbed by 29.1% of the retired farmers, which approximates very closely the figure found in a similar study[4] made of present owners of land in Nebraska, where the corresponding percentage was 29.7%. But both are somewhat lower than the 34.7% of owner-operators in the United States who rose to land ownership by this route. An equal percentage of retired farmers are found to have risen to land ownership by means of the FWTO and FHTO "ladders", a combination of which is comparable to the FHTO group in the Nebraska study where the percentage was 25.2%. These percentages are considerably lower than the 47% of owner-operators in the United States who passed through these stages. Only 9.7% of retired farmers were able to take the short cut from the farm-boy stage to that of owner, as compared with 14.8% in Nebraska. None among the present owner-operators took this direct step.

Returning to Chart V, more than half of the retired farmers acquired their land by purchase, which is an appreciably larger percentage than that shown for owner-operators and part-owner-operators. Inheritance, marriage, and gifts have played a correspondingly larger part in the acquisition of land by the present operators. The few who received land by gift from their parents might be called cases of "premature inheritance."

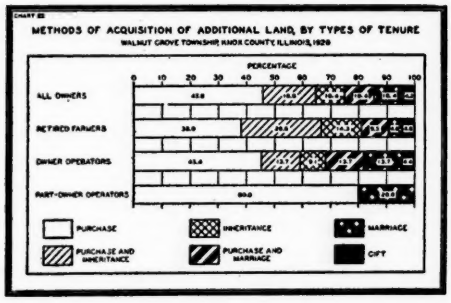
After acquisition of the first land, additional land was acquired by 67.7% of the retired farmers, 68.7% of the owner-operators, and 29.4% of the part-owner-operators. Of the retired farmers who came to own additional land 28.5% were in the FTO class, 33.3% in the FWTO and FHTO classes, and 14.3% in the FO class. Of the owner-operators who acquired additional land, the percentages for the three kinds of "ladders" most generally climbed are: FTO, 40.8%.

[3] W. J. Spillman, "The Agricultural Ladder," *9 American Economic Review*, No. 1, pp. 170–9 (1919).

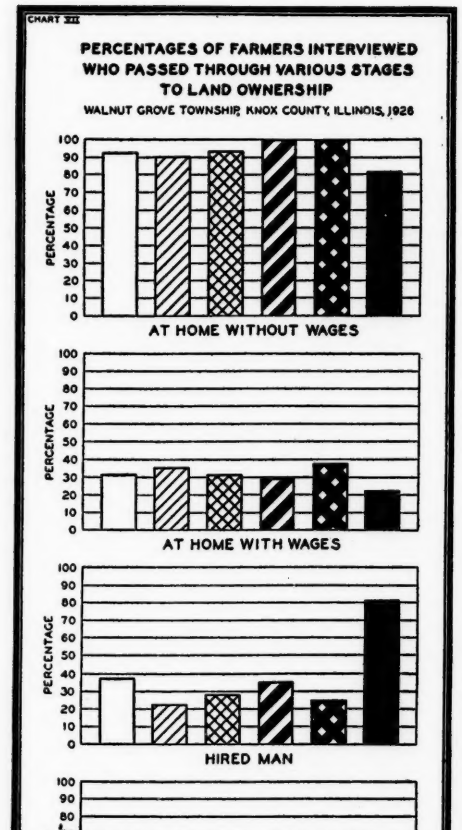
[4] J. O. Rankin, "Steps to Nebraska Farm Ownership," *Nebraska Experiment Station Bulletin 210*, p. 25 (1926).

FWTO and FHTO, 44.4%; and FLTO, 7.4%.

The methods of acquisition of additional land among the three classes of owners are presented on Chart VI. A comparison with Chart V will reveal that, in the case of retired farmers, purchase played a much smaller part in the acquisition of additional land than it did in securing the first land, but the opposite conclusion is reached with reference to owner-operators and part-owner-operators. As only five part-owner - operators acquired additional land, too much importance must not be attached to the percentages of this tenure class on Chart VI.



The percentage of the different classes of tenure who spent some time in the various stages is shown on Chart VII. In every tenure class except unrelated tenancy over 90% spent some time on the home farm without getting wages. The part - owner - operators and related tenants did so without a single exception. But even among the unrelated tenants more than 80% stayed at home to work for a shorter or longer period of time without pay. For most of them there was probably little prospect of buying or renting their fathers' farms, and hence they were unwilling to stay and work there without remuneration. Also, as was previously shown, more than 20% of them were not born on a



farm; some of these, however, seem to have moved to farms with their parents while they still were children.

Although not quite one out of every three in all tenures worked at home for wages, a somewhat larger percentage of retired farmers and related tenants, and a smaller percentage of owner-operators and part-owner-operators did so. The class of unrelated tenants again has a considerably smaller number who have passed through this stage, less than one in four. The main reason for this is undoubtedly the same as that suggested in the former stage, since wages paid for working at home are usually lower than could be obtained when working for a stranger. This discrepancy in wage rates in favor of the man who hires out to a stranger is often counter-balanced by the hope of future reward in the form of a favorable rent contract or easy terms of purchase from the father. Those whose parents were never engaged in agriculture naturally omitted the at-home with-wages stage.

Since working at home with wages and working out as a hired man are more or less alternatives, it is only natural that a high percentage among a certain tenure class in the former stage should be accompanied by a low percentage in the latter stage. It stands to reason that many who work at home with wages never become hired men of others, and vice versa, although a considerable number do both. For all tenure classes the percentage which passed through this hired-man stage is 37.4%, the number of part-owner-operators using this step being 2% lower, and all the others, except unrelated tenants, from 9% to 15% lower. The high figure of 81.5% among unrelated tenants is to be expected in view of what has been said previously regarding this class.

Another alternative for the accumulation of the necessary money for the operation of a farm is working in other occupations. This was done by more than 20% of the total number interviewed. The relatively high percentage of retired farmers who worked at other occupations is partially accounted for by their nationality. Having been engaged in other occupations during their youth in their native countries in Europe, they no doubt grasped the opportunity of becoming independent farmers on the practically free land in America. Other early settlers first found work in the cities, because the demand for farm laborers was not so great in the early days as it became later. Many of the unrelated tenants also have been engaged in other occupations previous to taking up farming, probably preferring work in the city where wages seemed better than in farm work, although more than 10% did both.

The percentage of persons who passed through the tenant stage is uniformly large in all tenure classes. The 94.2% given for all tenures is somewhat misleading, because it includes the present tenants. A more significant figure is the percentage based only on those who have already completed their tenant stage, namely, retired farmers, owner-operators, and part-owner-operators. In keeping with the general trend toward an increase in tenancy for the country as a whole, a larger percentage of owner-operators than of retired farmers were tenants. Owner-operators are, for the most part, younger than the retired farmers, and the increase of over 13% in tenancy among them as compared with the previous generation of farmers, results from the greater difficulty attending the ownership of land as the pioneer period is left behind. Hence, fewer farmers now are able to become owners of land without first renting

from others. This tendency is further borne out by the fact that the part-owner-operators, who are just in the transition stage between tenancy and complete owner-operation, have without exception been tenants before becoming landowners.

The next thing to be considered is the length of time it has taken the various tenure groups to reach their present status. The second installment of this article will analyze the time spent on each rung of the "agricultural ladder" by each tenure group and will also include a more detailed analysis of the different stages in achieving ownership as are represented by the farmers of this area.

CAPITAL AND MAINTENANCE EXPENDITURES IN PUBLIC UTILITY ACCOUNTING

By JOHN H. BICKLEY

A PROBLEM that is constantly demanding the attention of accountants of expanding manufacturing and public utility enterprises is that of distinguishing between capital and maintenance expenditures. If an industry is owned by its immediate managers who are fully cognizant of the accounting procedure, an ultra-conservative policy of loading operating expenses with property additions and betterments may be followed, with sole responsibility to government taxing agencies in reporting property and earnings. On the other hand, if there exists a group of non-managing owners, or if there is outstanding a class of non-voting stock, irreparable injury may result from an erroneous allocation of costs. Before the advent of income tax laws, the owner-managers of profitable industries frequently extended and improved their plants by charges against maintenance, thereby creating a reserve of value which, although contributing to increased production or economies in operation, was not reflected by property accounts. Not many years ago, this was a common practice of railroads. Very little reliance could be placed on their financial statements, but those familiar with the actual facts could profit by a purchase and sale of securities.

In the case of public service companies, public regulation over rates, security issues, and service adds special significance to the problem and demands an assignment of costs that is in harmony with facts and not the product of a desire to attain a certain result. The charges for service rendered by a utility being predicated upon property values and operating expenses, an unsound accounting practice may impose unfair burdens on the consuming public and give the utility added plant capacity or economies at a direct cost to its patrons.

In the past, regulatory commissions were apprehensive that utilities would inflate their fixed capital by charges that were properly assignable to current maintenance. It was feared that such expenditures would be incorporated in the basis for computing reasonable rates and thus constitute a double charge upon the public, first, by treating the repair as an addition or betterment, and, second, by calculating a percentage return, in future years, on this expenditure. Today, the real danger might be in the other direction; instead of an inflation of capital accounts there may occur a padding of operating costs. The imminence of this is seen by reference to current methods of commissions in passing upon the reasonableness of rates. One of the elements that must be considered in measuring the fair value of property used and useful in public service is the estimated cost of replacing the property at spot prices, less accrued depreciation. This element of value is determined by first preparing an inventory of the property and then applying unit prices. This, in itself, demands no consideration of how the property was financed, whether out of profits, by

security issues, or by operating charges. Consequently, the greater the weight that is attached to reproduction costs, the more urgent is the need for public control over capital and revenue expenditures.

The advantage to a utility of including in its operating expenses items that are properly chargeable to fixed capital may also be seen from a different angle. A utility is entitled to revenue sufficient to meet operating expenses, including taxes and depreciation, and, as generally expressed, a fair return on the value of its property. This means that every dollar of operating expenses may be compensated for out of the charges for service, but that only a stipulated percentage may be received as a return on property. Thus, if 7% is considered a fair return, each dollar of operating costs has as much weight, in a rate controversy, as $14 of fixed capital. Because of this fact, there is a strong incentive for an enterprise to charge against operations outlays which, in reality, are incurred in improving its plant.

Prior to the enactment by Congress of the Transportation Act of 1920, attention was focused primarily upon the investment in road and equipment of steam railroads. The Interstate Commerce Commission classification for these carriers was designed to give a correct statement of property costs. The section in the Transportation Act providing for the recapture of earnings above a given percentage has shifted emphasis to the question of income. In an earnings equation, the factor that is most within the control of railroad management is maintenance costs. Revenues depend upon business conditions. Transportation expense, the largest single item of operating costs, depends principally upon volume of traffic and, therefore, is less subject to managerial discretion than other classes of expense. A certain amount of maintenance work is essential to high operating standards, but whether or not standards are to be improved and betterments made are problems for directors and officers to decide, subject to corporate finances and competitive conditions. Furthermore, the line between maintenance and improvements is often so uncertain that, in the absence of well-defined rules, much is left to the judgment of a company in allocating expenditures.

The extent to which an improper distribution of costs will occur may depend upon the financial position of each company. If earnings are small and the utility is merely eking out an existence, the need for maintaining credit will be a sufficient deterrent against padding current maintenance and may lead to the opposite result. The financially strong and prosperous enterprise, however, may find it advantageous to burden maintenance with capital outlays without in any way impairing its credit.

Terms of Various Accounting Classifications

The instructions on capital and revenue expenditures, accompanying the fixed capital and operating expense accounts in uniform classifications of accounts prescribed by state public service commissions, are with few exceptions peculiarly inadequate. In no classification is the deficiency more evident than in that adopted for electric utilities by the National Association of Railroad and Utilities Commissioners and by approximately half the state commissions. If utilities were guided solely by this system, they would be free to interpret

expenditures in their own way and there would not, of necessity, be any uniformity in their practices. The only provisions that are even remotely related to the problem are the following:

> The foregoing instructions [referring to instructions on withdrawals and retirements of fixed capital] do not apply to the retirement of those minor parts, the charges for replacing which are made directly to maintenance expense accounts.[1]
>
> The term "operating expenses" as used in this classification means such expenses as are necessary to the maintenance of the corporate organization, the rendering of service required or authorized by law. . . .[2]
>
> *Current maintenance* includes such expenses necessary to maintain the tangible property in a state of operating efficiency as do not result in a substantial change of identity in any particular unit of property. It includes the cost of minor replacements of small parts commonly called the cost of repairs, but it does not include the cost of replacing individual structures, facilities or units of equipment or important sections of continuous structures such as electric line. Current maintenance costs are chargeable to operating expenses and, wherever the word "maintenance" is used in the definition of an operating expense account, current maintenance is to be understood. The cost of replacing the larger units is chargeable to fixed capital from which the cost of the property replaced must be deducted.[3]
>
> The cost of replacing minor parts, which is not recorded by any entries in the fixed capital accounts and which is commonly called the cost of "repairs" or "maintenance" as distinguished from the cost of "replacements" of larger units, need not be provided for through a retirement reserve.[4]

The other references are in the individual maintenance accounts.

It is almost inconceivable that one of the most vital questions in any classification of accounts should have been passed with such scanty reference. When the so-called "national classification" is contrasted with the more comprehensive classifications of the Federal Power Commission and the Public Service Commission of Pennsylvania, one must conclude that it is only because of inertia that the "national classification" survives.

The Federal power system divides charges to fixed capital into two groups, those for additions and those for betterments:

> *Additions* are additional facilities, such as equipment, land, structures, and other tangible property; additions to such facilities, such as extension of transmission and distribution lines, buildings, and other structures; additional wires put in the existing transmission or distribution system; additional devices applied to facilities, such as safety devices applied to equipment not previously equipped. . . .[5]
>
> *Betterments* are improvements of existing facilities through the substitution of superior parts for inferior parts retired, such as the renewing of a tin roof on a building with one of copper; the strengthening of bridges or other structures by the substitution of heavier members; the replacing of parts of machines, like runners or buckets on turbines, or bearings, valves, and other parts of machines, or flues of a boiler, etc., with parts taking the place of those retired, but of improved or superior design or type.[6]

It is provided further, under fixed capital:

> If the property retired is of minor importance, such as a small building or other small structure, or unit of equipment, and it is replaced in kind for a like purpose without betterment, the cost of the replacement shall be charged to the appropriate maintenance accounts in operating expenses, or to a reserve, if a reserve has been created, and no adjustment made in the fixed capital accounts.[7]

When the renewals to be made to an im-

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[1] National Association of Railroad and Utilities Commissioners, *Uniform Classification of Accounts for Electric Utilities*, p. 33.

[2] *Ibid.*, p. 82.

[3] *Ibid.*, p. 83.

[4] *Ibid.*, p. 84.

[5] *System of Accounts for Licensees under the Federal Water Power Act*, p. 34, sec. 3, par. (*f*).

[6] *Ibid.*, p. 34, sec. 3, par. (*g*).

[7] *Ibid.*, p. 37, sec. 8, par. (*b*).

portant building or other structure, or to an important item of equipment, will constitute the major portion of its value when renewed, the property, when taken out of service, shall be considered as retired and accounted for as provided above, and for the purposes of this classification the renewed property shall be considered as an addition, and the appraised cost thereof shall be included in the accounts of this classification, consideration being given to the second-hand portions remaining therein. In no case shall the charge for the renewed property exceed the cost (at current market prices of labor and material) of new property of equal capacity and equal expectation of life in service, less a suitable allowance on account of the second-hand parts remaining therein.[8]

In the *Uniform Classification of Accounts for Electric Companies,* prescribed by the Public Service Commission of Pennsylvania, the definitions and instructions pertaining to fixed capital are similar, in some respects, to those in the Federal Power Commission system, but the property charges are divided into three groups, as follows:

Additions are land, structures, and equipment added to those in service at the beginning of operations and not taking the place of any property of like purpose previously held by the utility. (Page 43.)

Betterments are physical changes in structures or equipment, the object of which is to make the structures or equipment affected more useful or of greater capacity than they were at the time of their original installation or acquisition. The utility shall charge as a betterment to the appropriate subaccount of "101. Fixed Capital Installed Since December 31, 1918" account that portion of the cost of such changes as will, when added to the original cost of the structures or equipment bettered, give the cost of the structures or equipment in their bettered condition. (Page 43.)

Replacements are those installments of fixed capital in which one structure or unit of equipment is substituted for another which has become exhausted or inadequate in service, the substitute having substantially no greater capacity than the property replaced; also the extensions of life period of franchises, patents, and other fixed capital. (Page 43.)

In every replacement the cost of fixed capital retired shall be credited to the fixed capital accounts in which it is carried, and the cost of the fixed capital installed in place of fixed capital so retired shall be charged to the appropriate subaccounts of "101. Fixed capital Installed Since December 31, 1918" account. (Page 43.)

The provisions of the Federal Power and Pennsylvania classifications have been cited at length because they are representative of the better systems and, in fact, superior to the majority in operation today. Having before us the definitions of additions, betterments, and replacements, we can examine their meaning and scope with a view to determining in what manner and to what extent they meet the problems of fixed capital accounting. Later, we shall consider the provisions covering the subject of maintenance.

Additions

The definitions of additions are ample for most purposes and in substance refer to the acquisition or installation, for utility use, of property not previously existing or held by the corporation, or not taking the place of like property, when the new property has an expectation of life in service of more than one year from the date of installation in service. One class of work frequently encountered in connection with additions is covered only indirectly by the instructions. Where an extension is made to a building, as the construction of a wing, usually the removal of the wall at the juncture of the old and new structures creates a problem. Should the cost of razing this wall be capitalized, be charged against the depreciation reserve, or be treated as an operating expense? Should the original cost

[8] *Ibid.*, p. 37, sec. 8, par. (*d*).

of the wall be charged against the depreciation reserve or against revenue? The answers to these questions are of far-reaching importance, as similar problems arise in other forms. With respect to the first query, the Federal Power classification provides that "the cost of removing old foundations" in connection with additions and betterments "shall be charged to the appropriate operating expense accounts."[9] But account "241. Depreciation Reserve" provides that the cost of demolishing property retired shall be charged to the reserve, and according to the fixed capital instructions, Section 8, this method is followed whether the property is replaced or not. It would appear from this language that the two sections of the classification are contradictory.

If we attempt to argue the question on its merits, we find two conflicting points of view, neither of which would point to the disposal of the removal cost as an operating expense. As the demolition expenditure was incurred directly in the construction of an additional building or wing, it might be associated with the cost of this structure or with the enlarged facility as a whole. But we at once encounter the other phase of the entire operation—that the cost of removing the old wall might accompany the final treatment of the original cost of the wall itself. When a unit or major part of a unit of property is retired from service, the original cost is credited to fixed capital, and either the amount accrued in the depreciation reserve for such property or its original cost, less salvage value, is charged to the reserve. Without further comment, it may be said that the cost of fixed capital to be provided for in the depreciation reserve should be the complete cost of the property, exclusive of maintenance and operation, from the date of acquisition and installation to the time of its final removal. Therefore, provision must be made for the estimated cost of removing the property at the time of its retirement from service. By the application of this principle, the removal of the wall is linked with the accounting disposal of the wall itself, and as the cost of the latter should be charged against the depreciation reserve, so should the expenditures in removing the wall. As a result of this method, the accounts will reflect the cost of a structure or facility as it exists at any particular time or the cost that would have been incurred had the property been constructed and completed in its present condition without change or modification. If, in building an addition to a structure, a part of the original wall is removed, it disappears from the scene and its cost and the cost of removal should not appear in the cost of the building as enlarged. Any original expenditures or those in connection with additions that do not reflect the cost of a structure as it stands should be eliminated from fixed capital.

A distinction might be made between removal costs when a retired unit or part is replaced and when a replacement is not effected. This, however, would lead to endless confusion because of the frequent difficulty in deciding whether or not there has been a replacement. A safe and workable rule would be to allow the cost of a removal to follow the allocation of the cost of the unit or major part retired; if the latter is not cleared from fixed capital, the removal cost would accompany the charge for the new work. As a corollary, removal costs in connection with maintenance should be charged against current operations.

[9] *Ibid.*, p. 38, sec. 13.

The assumption has been made that the amount carried in the buildings account for the wall demolished should be credited to that account and a charge made to reserve for depreciation. This assumption is predicated upon two facts, first, that the wall is a major part of the building as a unit, and, second, that its removal has occurred in conjunction with a building addition that increases the capacity of the structure as a whole. An analogy is found in the removal of a building roof to make way for the construction of additional stories, the foundation and existing walls being adequate to support the addition. In this case, a new roof of like kind may cover the heightened structure, but the roof is a major part, and the destruction of the old and the building of the new does not happen in the course of current operations or in maintaining serviceability.

Betterments

An addition is something that can be measured physically and readily identified, but many complications arise in ascertaining when a betterment, as distinguished from a repair, is made. When the definitions of betterments in the Federal and Pennsylvania classifications are considered jointly, a fairly complete explanation is found. The Pennsylvania classification presents a definition in the abstract and the Federal gives several illustrations to indicate when a betterment occurs. The fundamental difference between the two is that the former makes no reference to parts but the latter defines betterments as "improvements of existing facilities through the substitution of superior parts for inferior parts retired. . . ."

The two perplexing questions are: What constitutes a part, as distinguished from a unit, the betterment of which may be capitalized? What are the tests of increased usefulness, greater capacity, or superiority? In definitions of betterments and maintenance, the words "units" and "parts" are emphasized as means of identifying expenditures. An attempt to define a part in a way that would be of service in drawing a line of demarcation between improvements and repairs contributes little or nothing to a solution of the problem. Literally, it is a certain portion or fraction of a thing, but this conveys no idea concerning property charges. An accurate and consistent distinction, in the abstract, between units and parts is difficult of attainment. If it were a matter of physical structure, a certain piece or body of material would always be the same, but this would not hold.

In passing upon an expenditure for the purpose of deciding whether it is a betterment or a repair, several tests may be applied, one or all of which might indicate the allocation of the item. Does the expenditure—

1. Prolong the life of (*a*) the part affected, or (*b*) the unit of which the part is a component?
2. Increase the capacity of the unit by adding to its strength or carrying capacity?
3. Increase unit output in a given time?
4. Lower the unit cost of production?
5. Decrease future maintenance expense?

It is generally conceded that if an expenditure prolongs the duration of a unit beyond its originally estimated life, it is a betterment. But the life of property is not the sole, or the most essential, criterion of its value. Other factors are productive capacity and costs of operation. If a part is replaced by one that gives a machine a larger productive capacity over its service life or that reduces unit costs, there has been

an addition to value that may be capitalized.

According to the Federal Power classification, if a tin roof is replaced with one of copper, there is a property betterment. The life of the roof is increased but not the life of the building, and there is no change in usefulness, capacity, or output. The improvement results from two conditions: (1) a longer life for a copper roof than for one of tin, and (2) a saving in future maintenance cost. The next problem is to measure the extent of the betterment. By customary accounting procedure, if a new tin roof of no better quality of tin is attached, the cost of renewing the worn-out covering and the labor and material cost of the renewal are treated as a repair expense, even though prices are higher than at the time the original roof was installed. Any betterment is a product of the superior material used and does not take place by reason of any change in cost of material or labor, and it reasonably follows, by the acceptance of this method, that the addition to fixed capital is the excess cost of the better material used in the renewal.

The same classification contains an instruction on this point that is open to serious doubt. At page 34, section 3, paragraph (*g*), it is stipulated that "The cost chargeable to fixed capital accounts of this system of accounts is the excess cost of the new parts installed over the cost at *current prices* of new parts of the kind retired." (Italics mine.) Thus, the charge or credit to fixed capital is based upon current prices of both the old and the new. An examination of the following hypothetical figures shows conclusively that an improvement accompanying a renewal and involving a change in ledger values should be in relation to the actual cost of the property retired and the expenditures for the new property, and that the addition to fixed capital should be the excess cost of the improved parts over the original cost of the parts retired. The amounts given below represent material prices only.

Original Cost	Present Costs		Amount in Fixed Capital	
	Same Material	Better Material	Federal Classification	As It Should Be
100	125	150	125	150
100	75	90	115	90
100	75	110	135	110

By the application of the Federal Power rule in this illustrative case, the material element in the property account is not always carried at the actual investment in the material, and, if replacement prices are less than at the time of original construction or installation, the ledger value will be in excess of either original or replacement cost. On the other hand, a proper computation of the betterment causes fixed capital to reflect at all times the actual investment in the new materials or parts. Consequently, the attachment of the copper roof would be divided between the charge to a plant account for the added material cost and the charge against current operations for an amount equal to the cost of the old roof together with the labor cost in installing the new copper roof and the expense of removing the old. Salvage would reduce the expense charge. According to this procedure, there would be no charge to the depreciation reserve for the original cost of the roof removed.

A fundamentally different course might be pursued. If the roof covering were considered a distinct structural element of the entire building, the original cost would be cleared from fixed capital and the reserve for depreciation

charged with the amount accrued for the roof, in the case of unit depreciation, or, in the case of group or composite plant depreciation, with the whole initial cost. The reserve would be charged also with the removal cost and credited with salvage. In this case, the scrapping of the old roof and the installation of the new would be two separate operations. The addition to fixed capital would be the excess of material and labor costs in installing the copper roof over the initial material and labor costs of the tin roof.

By the first course, the property would be enhanced only by the increase in material. By the second method, a renewal of a tin roof with one of like kind would be treated the same way and would constitute an addition to the book value of property to the extent of any increase in commodity and labor prices. Of the two methods, the first appears to be more widely employed and, in a period of rising prices, leads to a smaller addition to capital. The second, however, possesses the advantage of showing the various operations more clearly in fixed capital accounts. If the second course is followed, the depreciation reserve must provide for renewals of roofs and similar structural elements.

One of the tests of a betterment, listed above, is a saving in maintenance expense as a component of operating costs, and this was an important factor in making the copper roof an improvement. The refinishing of a trolley car with a quality of paint that is superior to any previously known might bring a saving in maintenance to compensate for added cost. Analogous to the case of a building with a copper roof, there is no extension of life of the structure or unit of equipment as a whole, neither is there any change in capacity or serviceability. In contrast, however, the paint on a car could not be viewed as a structural element, and, considering all the car painting operations of a company, refinishing will take place at a uniform rate with an equalization of annual expenditures.

In the Interstate Commerce Commission *Classification of Accounts for Steam Roads,* now effective, it is provided, in the instructions pertaining to Road and Equipment accounts, that certain costs in connection with additions and betterments are to be charged as operating expenses.

> The cost of removing old material from equipment, and from buildings, bridges, wharves, tracks, and other fixed improvements, shall be charged to the appropriate operating expense accounts. Such charges shall include the cost of removing old foundations and filling old excavations, and restoring condition of grounds after addition and betterment work; rearranging or relocating existing tracks; relocating telegraph and telephone poles or lines, fences, track and other signals, buildings, bridges, trestles, culverts, and other structures, and farm and highway crossings, including crossing gates and alarms, when the provisions of Section 8 of these instructions are not applicable; and maintaining or protecting traffic during the progress of addition and betterment work, including the cost of constructing, maintaining, and removing temporary tracks required for maintaining traffic during the progress of the work.[10]

The "Tentative Accounting Rules for Steam Roads, Draft of October, 1926," contained this section in substantially unmodified form, but it is omitted in the "Tentative Classification of Investment in Road and Equipment of Steam Roads, Draft of April 26, 1927," and reference is made to only one class of expenditures cited. In Section 6, covering Property Changes, "the cost of removing the foundations and

[10] *General Instructions,* sec. 12, p. 14.

filling excavations of buildings removed" is chargeable to depreciation reserve. This is a desirable reversal of practice. It may be almost a post-mortem observation, but there has been little, if any, merit in dissociating any class of work from its purpose, which, with respect to Section 12 of the present classification, is to contribute to an addition, betterment, or replacement, as is specifically recognized in the title to the section, "Expenses in Connection with Additions and Betterments."

There may be some objection to charging to a building account the cost of "restoring condition of grounds after addition and betterment work," but this might be avoided by the use of an account "Improvements to Grounds." Certainly there is no relation between restoring the condition of grounds and the expense of current operations. If the costs of "shifting existing tracks; relocating telegraph and telephone poles or lines, fences, track and other signals, buildings, bridges, trestles, culverts and other structures," and so forth, are to be charged against revenue, the carrier or utility may, in periods of prosperity, add to the serviceability of its property, increase the speed of trains, permanently reduce operating costs, experience no periodically recurring expenses for the same work, and accomplish these economies and betterments by direct charges against the public. The potency of this method for eliminating curves is evident.

Relocation of Property

A common experience for most utilities is the relocation of facilities such as shop machinery, power house equipment, transmission and distribution lines, tracks, and telephone and telegraph lines. The foregoing section of the Interstate Commerce Commission classification specifically provides that the cost of such work shall be charged against current operations. Unfortunately, in reviewing classifications, we cannot always satisfy our curiosity to know the reasons that prompted a government agency to prescribe a certain method. A few illustrations, however, may serve to test the logic and the practicability of treating such expenditures as operating charges.

In order to meet an increasing power demand, an electric utility finds it necessary to increase the size of its power plant building. At the completion of this work, an additional prime mover, generator, and auxiliary equipment are installed; but in order to provide sufficient space and to have the most advantageous arrangement of facilities, some of the existing equipment must be relocated. How should the costs incurred in the rearrangment be charged? In a case of this kind, two distinct steps are found; first, the removal of the equipment to a new position, and, second, the tearing out of the old foundation and the construction of the new. Every item of cost incurred in this operation as a whole is in connection with a plant addition and results directly from the enlargement of the generating station. There is not the remotest relation between this work and the operation and maintenance of the engines and generators after they are installed. If engine foundations must be removed, the entire original cost of the foundation must be credited to fixed capital and simultaneously charged, in whole or in part, to depreciation reserve. The cost of tearing out the foundation must likewise be charged to the reserve. The expenditures for new foundations and the labor and other expenses in

moving and setting the equipment are carried to fixed capital.

Now, is it essential that the station building be enlarged in order to justify this treatment of the costs of relocating equipment? Let it be assumed that the building is sufficiently large to house additional units provided the existing ones are rearranged. Identically the same problems arise, and the fact that a structure is not increased in size does not demand a different solution of the accounting questions.

As the next step, we may consider a station that is not to be increased in size either by the construction of a building addition or by the installation of additional equipment. The only change is to be a relocation of existing facilities. The obvious question must be, Why should a company undergo such expense? The answer, even more obvious, is to effect some economy in operation or to gain some advantage that will compensate for the expense incurred. To determine whether or not the cost is self-compensating, there must be a comparison of operating savings with charges on the funds expended, allowance being made for the estimated period over which the savings will accrue. If this comparison indicates that the change is financially expedient, charges must be made as in the first and second cases. If the test of capitalizing such costs is an addition to the value of the plant and if earnings are an index of value, then anything that reduces the operating ratio, assuming no offsetting increase in fixed charges, adds to value.

Conditions sometimes arise that force a utility to move property at an expense that perhaps cannot be paid by a saving in future operating costs or by an increase in revenue. Such a condition is found in a municipal ordinance requiring a utility to place its overhead lines underground or compelling a street railway company to move its tracks from the side to the center of a road. The latter condition has been specifically ruled upon by the Interstate Commerce Commission. In Accounting Bulletin No. 9, "Decisions upon Questions Raised under the Uniform System of Accounts for Electric Railways," Case 263, it is provided that:

> If no additions or betterments were made in connection with the transfer of the track from the side to the center of the road, the expense incurred in connection with this removal shall be charged to Operating Expenses.

This decision was rendered prior to 1915 when, as previously discussed, there was a general effort to prevent an inflation of property accounts. If the ruling was not inspired by fear of such manipulation, it is at least insupportable today. To charge against operation the cost of moving a large section of track might seriously distort expenses and unduly weaken the operating statement for the current period. This alone justifies a reconsideration of the prescribed method, but there is another significant element in the question. The tracks were doubtless ordered moved as a part of a program of municipal improvement to which the street railway was called upon to make its contribution and in which it would share along with the community as a whole.

Rehabilitating Purchased Property

Fixed capital expenditures that may be placed in a distinct category are those necessary to rehabilitate, and put in efficient operating condition, second-hand purchased property. No provision is found in the National Association electric classification for this im-

portant question; but, in sharp contrast, the classifications of the Interstate Commerce Commission and the Federal Power Commission meet the problem and leave little room for individual opinion. If such work is necessitated by conditions inherent in the assets at the time of acquisition, the cost must be capitalized, even though the same operations might ordinarily be classified as repairs. It is reasonable to assume that allowance was made in the exchange price for the deterioration. Therefore, the cost of rehabilitation is an addition to the cost of the property. This problem sometimes calls for penetrating analysis. An operating unit might be acquired and continued in use several months before overhauling is undertaken, and it might be inferred that because the expenditures would customarily be treated as maintenance expenses, they should be in the case at issue. Manifestly, this opens the way to arbitrary judgment, but a study of the particular work and the frequency with which certain repairs are made would disclose the actual facts. As an example, if a utility acquires a generating station that has been operated for a period of years and finds it necessary to install new sets of boiler tubes, the expenditures must be charged to boiler plant equipment. When the old tubes are removed, fixed capital is credited with their salvage value and not with their original cost to the vendor company because, presumably, in the sale of the plant allowance was made for the deterioration of tubes.

Replacements

It is interesting to observe that the Federal Power classification, in contrast with the electric classification of the Pennsylvania Commission, contains no definition of a *replacement.* The only apparent need for this definition is to distinguish the replacement of a *unit* from the renewal of a *minor part,* whence arises the troublesome problem of what constitutes a part as distinguished from a unit. By the terms of the Pennsylvania classification, a replacement is the substitution of one structure or unit of equipment "for another which has become exhausted or inadequate in service, the substitute having substantially no greater capacity than the property replaced." A betterment frequently accompanies a replacement, but even though the former does not occur, the accounting procedure is identical. When a unit of property is retired from service, the original cost is credited to fixed capital and the depreciation reserve charged with all or part of such cost. At the installation of the new unit, fixed capital is charged with its actual cost. Thus it is seen that the replacement, or the replacement and betterment, can be divided into two steps; first, the removal of the old unit, and, second, the installation of the new. This process does not necessitate a definition of replacements.

In the Interstate Commerce Commission classifications for steam roads and electric railways one finds certain provisions with respect to property retired and replaced and property retired and not replaced that have been the source of heated controversy. In both cases, the original cost of the retired property is credited to fixed capital; but when there is a replacement, the excess of original cost plus the cost of removal less salvage over the amount of depreciation that has been accrued on the property is charged to the operating expense account appropriate for the cost of repairing the property retired. On the other hand, if the property is not

replaced, the excess is charged to profit and loss (surplus). In order to avoid a distortion of operating expenses, it is provided that relatively large items may, if so authorized by the Commission, be charged to a suspense account, "Property Abandoned Chargeable to Operating Expenses," and be written off over the future. By this process, future patrons pay not only the depreciation on property used in their service but also a part of the cost of property abandoned in the past.

What constitutes a replacement of property retired is a question that leads to a wide divergence of opinion and, in recorded cases, to rather grotesque views. Several years ago, in a street railway rate inquiry, it was contended that where a section of track was taken up in the southern end of the city and another section built in the northern end, the piece built in the north was an actual replacement of the piece taken up in the south because of changed operating conditions. The circumstances under which this would occur were not volunteered, and enlightenment was not sought by the protestant. By the same reasoning, it might be argued that if a building in the northern section of the city were abandoned or demolished and another constructed in the southern section for the same purpose, the new building replaced the old and the cost thereof should be charged as an operating expense. By what flight of the imagination these changes could be interpreted as renewals is difficult to conceive, but the procedure lends itself easily to the creation of secret reserves. There appeared to be no consideration of price changes nor of the possibility that during the period of time elapsing between the construction of the old and of the new track or building, labor and commodity costs might have changed materially. The same carrier insisted that if it were to replace cars substantially in kind, the entire cost of the new cars should be charged as an operating expense, allowance being made for salvage on the old units. In fact, the witness for the company went a step further and testified that the company might set up a depreciation reserve for cars and if the cars were renewed in kind, the entire cost of the new cars might be charged to maintenance. It must be pointed out that he discussed this solely as an academic question but only because, in the experience of his company, cars were not renewed in kind. Nevertheless, the principle was clearly enunciated and, if allowed to stand, opens the way to serious abuse.

Theoretically, according to this doctrine, a utility might entirely replace all its track, structures, and equipment during a period of rising prices and not change its property accounts but place the entire charge against its patrons at the time of the renewals. Consequently, from the standpoint of actual cost, the same property might increase 100% but the increase would not be reflected in the accounts. When we consider the weight that is attached to reproduction cost in current value-finding for rate purposes, this accounting practice has added significance. During the period from 1913 to 1923, a utility might have replaced in kind a large part of its plant by direct charges to operations. In 1924 an appraisal at reproduction cost would have shown a substantial increment over book cost, and if reproduction cost were given major weight the company would, for all practical purposes, have the benefit of the advances in prices after having saddled the increase on the public as an operating expense. If depreciation has been accrued on the property replaced

in kind, there is a rare combination of operating costs imposed directly on the rate-payer: (1) current maintenance or repairs; (2) depreciation to provide for retirement; and (3) the cost of new property to take the place of the old. A fourth item, to be mentioned in review, is a return on an increment in value resulting from an increase in commodity and labor prices.

Obviously, this method offers great possibilities for a prosperous utility that is seeking to present a moderate showing of profits in order to increase its rates for service or prevent any inroads on its effective rate schedule. The only limit is a statement of earnings that supports the market for securities and that enables the utility to obtain funds on reasonable terms.

In the street railway case referred to, the state commission, in its majority report, made no criticism of the company's practice and apparently accepted it as sound and in harmony with the commission's classification. The blindness of regulatory bodies to accounting aberrations that obscure facts and jeopardize public interests indicates a failure to perform those functions for which such bodies were constituted.

By a reasonable interpretation of the Interstate Commerce Commission classifications, a replacement of property requires, first, a credit to fixed capital for the retired property and, second, a charge to the appropriate plant account for the new installation. According to present and proposed rules, if retired property is not replaced, the excess of ledger value over the amount of depreciation accrued on the particular property (ignoring removal costs and salvage) is charged to profit and loss (surplus); but, if there is a replacement, the excess is charged to operating expense. Whether or not retired property is replaced is not material to accounting procedure. The two steps, the retirement and the new installation, must be kept distinct and the entries placed on the same basis irrespective of renewals. This would eliminate the question of when a replacement is made and would place the classification in agreement with the Commission's Order No. 15,100, "Depreciation Charges of Steam Railroad Companies."

Maintenance

Two approaches to an understanding of maintenance are embodied in the Federal Power and Pennsylvania classifications. The Federal system states:

> "Maintenance" includes such expenses necessary to maintain the tangible property in a state of operating efficiency as do not result in a substantial change of identity in any particular unit of property. It includes the ordinary current daily, weekly, or monthly repairs, renewals, or replacements of parts of identifiable units of physical property or of continuous structures necessary to be made to keep the plant in current operating condition, such as those due to minor accidents, breakage, wearing out of small appliances or parts thereof, and the cost of tests or inspections to determine whether repairs, renewals, adjustments, etc., are necessary; also the cost of restoring to an efficient and proper condition buildings, structures, or other units of property which have deteriorated or which have been damaged by storms, floods, fire, or other casualties, and of recovering salvage and removing retired or abandoned property when such costs are not provided for by insurance or the depreciation reserve or other reserves. It does not include the cost of replacing structures, facilities, or units of equipment or important sections of continuous structures which have been retired from service. The cost of such replacements is chargeable to fixed capital account.[11]

From one point of view, a repair is a replacement of minor *parts* or an altera-

[11] *System of Accounts for Licensees under the Federal Water Power Act*, p. 95, sec. 2, par. (*g*).

tion that does not produce a change in identity of structures or equipment. The difficulty, however, of differentiating between parts and units has already been referred to and weakens this approach to a definition. The use of these terms in the abstract does not satisfy the practical need of identifying particular items as parts or units and, furthermore, does not indicate when a part is of such minor kind that its renewal is a maintenance charge. If a distinction in expenditures is to be made in this manner, there must be complete specifications pertaining to the various classes and components of property. Without the guidance of common standards, each accountant and engineer will place his own interpretation on renewals.

The substance of a repair is that it is employed to maintain a certain state of operating efficiency and serviceability without changing the identity of property, increasing its capacity, or prolonging its life beyond normal life expectancy. This means that, at the outset, there must be an understanding of normal use and expected life of property. If an expenditure increases efficiency or prolongs life, it is an improvement and must be charged as such. Repairs are usually made at frequent intervals and at a uniform rate, but when they occur at comparatively long periods of time and involve large sums, there must be special provision for the work.

In Regulations 69 of the United States Treasury Department, relating to Federal income taxes, it is provided:[12]

> The cost of incidental repairs which neither materially add to the value of the property nor appreciably prolong its life, but keep it in an ordinarily efficient operating condition, may be deducted as expense, provided the plant or property account is not increased by the amount of such expenditures. Repairs in the nature of replacements, to the extent that they arrest deterioration and appreciably prolong the life of the property, should be charged against the depreciation reserve if such account is kept.

Here, the prevailing thought with respect to a repair is that it keeps property in an ordinarily efficient operating condition without materially adding to its value or appreciably prolonging its life.

Various working rules have been devised for identifying repairs. Sometimes it is stipulated that a certain amount (as $200) shall be the minimum charge to fixed capital. Another provision is that if the cost of the parts renewed is a certain percentage of the cost of the unit, the renewal is to be considered a property charge. A weakness of the latter test is that the reconstruction of a machine might be subdivided into a number of repair job orders for the purpose of keeping within the allowances for expense charges.

One of the most comprehensive sets of rules governing renewals is that of the Board of Supervising Engineers for the traction companies of Chicago.[13] These rules specifically define the charges to capital and to maintenance according to various classes of property and the components of each class. But, in spite of these instructions, the allocation of certain expenditures must be passed upon by the Board at the time application for work is submitted by companies.

Equalization of Maintenance Expenses

Industries should avoid, by the use of provision and reserve accounts, violent fluctuations in repair charges due to abnormal work or conditions that

[12] Art. 104, p. 41.

[13] "Renewals as Defined by Board of Supervising Engineers, Chicago Traction."

arise at irregular intervals. Certain electric railways whose maintenance is somewhat seasonal have equalized maintenance costs over the twelve months of the year. This is specifically provided for in the Interstate Commerce Commission classifications for steam roads and electric railways by the use of "Equalization" expense accounts for way and structure, rolling stock, power equipment, and certain transportation items.[14] The method is to pro-rate equally, or on some equitable basis, over the months of the year the estimated cost of maintenance for the year. In case the expenditures of one month are less than the monthly allowance, an account, "Equalization," is charged and a balance sheet account, "Equalization Reserve," credited with the difference. On the other hand, when actual repair outlays exceed the monthly allowance, the excess is credited to "Equalization" and charged to "Equalization Reserve." By this procedure, the individual maintenance accounts are always charged with the actual expenditures, but the total maintenance costs are uniform from month to month throughout the year, allowance sometimes being made for the number of week days, Sundays, and holidays in each month. At the close of the year, the balance in the "Equalization Reserve" account is "extinguished through the equalization accounts in operating expenses in the accounts of the month of December."

The *Classification of Accounts for Electric Railways,* which became effective July 1, 1914, stipulates that "The account 'Equalization Reserve' shall be cleared annually unless at the end of the year there remains a credit balance due to the non-completion of maintenance work because of adverse labor conditions, non-receipt of material, or similar reasons, in which case such part of the balance as is applicable to unfinished work may be carried over to the following year." The proposed classification for steam roads requires that "All equalization reserve accounts shall be cleared at the close of the year through the accounts used in creating the reserves," and allows no alternative as to closing the account.

One of the largest metropolitan street railway companies in the country elaborated on the Interstate Commerce Commission plan and advanced it several steps by combining the allowance for depreciation with that for repairs for the purpose of equalizing, over a period of years, maintenance expenses for way and structures, rolling stock, and power equipment. The first step was to estimate the annual requirements for maintenance, retirements, and depreciation of the three classes of property and to appropriate the estimated requirements as a part of a budget program. The allowance for each class of assets was next distributed equitably over the twelve months of the year and, if the actual expenditures of any month exceeded the allowance for that period, an account "Equalization Reserve" was charged. Vice versa, if the allowance exceeded the expenditures, the reserve was credited. At the close of the year, a credit balance in "Equalization Reserve" was transferred to the balance sheet account "Accrued Depreciation—Road and Equipment" to provide for future retirements of property. With the exception of a uniform charge for certain cars under a car trust certificate indenture, the credit balance in the

[14] See "Tentative Revised Classification of Accounts for Steam Roads." *Operating Expenses, General Instructions,* sec. 18, and accounts 249, 329, 417, 444, and 456; also Balance Sheet account 775. See also the effective *Classification of Accounts for Electric Railways.*

equalization reserve, transferred to depreciation reserve, became the measure of book depreciation for the year. If, as actually occurred during two years, the expenditures exceeded the annual appropriation for maintenance, retirements, and depreciation, the excess, represented by a debit balance in the equalization reserve, was charged to "Accrued Depreciation — Road and Equipment." By pursuing this plan, the annual cost of maintenance and depreciation of way and structures, rolling stock, and power equipment was kept uniform, and any shortage in the appropriation was absorbed through the depreciation reserve.

It is interesting to note the influence of this method on charges for capital and revenue expenditures. Assuming that an outlay was erroneously charged to maintenance, the credit at the close of the year to depreciation reserve would be decreased correspondingly. Consequently, if the reserve were accepted as the measure of depreciation and deducted from fixed capital, the deduction would be less than if the expenditure had been capitalized. Yet if the charge had been properly made to fixed capital, there would have been an equal increase in the reserve, and the depreciated book value would have been the same by either method. But the significant fact about the erroneous entry is that if the expenditure is treated as a direct charge against the public, there is an overstatement of expenses, and the net amount of property (cost less accrued depreciation) is no less than it otherwise would be. On the other hand, if a repair charge were capitalized, the appropriation for depreciation would be increased and, in case the fixed capital charge were for a renewal, the reserve would be compensated in whole, in part, or for more than the retirement charge. This would give the appearance of a larger annual requirement for depreciation but might lead to a larger accumulation in the reserve than the utility would desire to show. The prosperous company would prefer to show higher maintenance expense as an indication of a high state of upkeep, as conservatism in making plant charges, and as a means of holding down its statement of profits and forestalling agitation for a rate reduction.

A comprehensive consideration of depreciation is beyond the scope of this paper, but it is so inseparably related to maintenance that the two cannot be entirely dissociated. There is nothing unique about a joint treatment of these elements, and the possibility of equalizing expenses is a cogent argument in support of any accounting procedure that accomplishes this result. Depreciation and repairs may be viewed as two phases of the single problem of prorating over useful life the expense of property on which these operating costs are incurred. Depreciation, like current upkeep, is a cost of possessing and using facilities. The former maintains investment and the latter serviceability, but both contribute to the maintenance of operations.

Although depreciation rules and rates cannot be established without reference to maintenance policies and even though equalization of costs is desirable, the latter is not to be accomplished by a sacrifice of fundamental accounting principles. Any system that takes as the measure of depreciation for a certain period the unexpended portion of a common appropriation for depreciation and maintenance fails to recognize the function of depreciation and subordinates this factor to repair expenditures. The function of depreciation is to

pro-rate over useful life the estimated loss to be suffered, on the basis of original cost, when property is retired from service due to wear and tear, obsolescence, inadequacy, or the demands of public authority. The particular time that a unit of output is produced should have no bearing upon the depreciation expense element in the total cost of producing the unit. Or, assuming that output, or intensity of use of structures and equipment, is uniform from period to period and that maintenance is always adequate, the output of one month or year should be charged for no more or less for depreciation than that of another period. Therefore, this operating cost in itself can and should be equalized or, if practicable, made proportionate to output, but not by basing it on an unexpended balance for depreciation and repairs.

Theoretically, at least, and in some instances in practice, repairs can be treated in a manner similar to depreciation, and the operating expense charges can be made proportionate to use of fixed capital. Parts necessitating repairs may be considered as wearing out uniformly over a given period or in proportion to the intensity of use of the part or the machine or other form of equipment or structure as a whole. Hence it may be reasoned that the particular time in the life of productive property when a unit is produced should not alter the repair cost in producing that unit. As applied to public utilities, there may be no justification for charging against one period more or less than against another because of variations in repair outlays, ignoring, of course, changes in labor and material prices and operating economies. Nevertheless, the method of equalizing costs should not be that of a joint appropriation for depreciation and maintenance.

The first step in an endeavor to equalize repair charges must be a segregation of those that occur monthly or annually at a fairly constant rate and those that are made at infrequent intervals on property the quantity or extent of which is not sufficient to stabilize the annual cost. It is with respect to the second class that the problem of equalization arises. In the iron and steel industry, the relining of blast furnaces is a major repair operation and takes place at intervals of about two years. As the cost of this work is as high as $100,000, if it were charged as a production expense against the period in which performed, the tonnage costs of that period would be unduly inflated. In order to spread the expense uniformly over output, each ton of iron is charged a certain number of cents for "Relining Furnaces" and a credit is made to account "Provision for Relining and Rebuilding Furnaces." In this way, each ton of iron bears its proportionate part of the relining expense, and, by the time the relining is undertaken, provision has been made for the work.

An alternative to the accumulation of a provision account would be to depreciate the furnace lining and, when the lining is renewed, to charge depreciation reserve and to credit fixed capital for the old lining, and to charge fixed capital for the new. The advantage of this method is that in a period of changing prices, fixed capital will reflect these changes and the actual investment in various units of property will be shown. But from the standpoint of equalization of costs, the same result is accomplished by either plan, except that, by the use of the provision method, rising prices are felt before the relining is made; and in case of depreciation reserve treatment, the influence

of a price advance is seen after the furnace is relined.

In the wholly private enterprise of manufacturing iron and steel, the problems of property expenditures and maintenance are not subject to government administration other than in reporting property and income for tax purposes. The accounting methods pursued by public utilities, however, are a matter of consequence to each patron of the utility, and the accounts may be the subject of strict regulation. As in the iron and steel industry, provision may be made for major repairs in the form of renewals, but by the use of a depreciation reserve that contains an accrual for the loss, based on original cost, of the major parts renewed. Thus, if a new electric light and power company is organized, or if an existing company constructs a new steam generating station, provision should begin at once for completely renewing sets of boiler tubes—an operation that may not take place for 10 or 15 years. To accomplish this, the periodic allowance for depreciation of boilers should cover depreciation of the tubes, and, when the original set is removed, the reserve must be charged and the asset account credited. This avoids placing an additional burden on the particular year in which the renewal is made, and at the same time, the property accounts show price changes and give the actual cost of equipment in service. Furthermore, this method avoids any controversy as to whether or not the new tubes are a betterment over the old.

In contrast to boiler tubes that are renewed in sets at long intervals, ballast, ties, and rails of street railway companies and poles of telephone, telegraph, and electric companies are renewed at regular intervals, and, in the case of a large utility that has attained an age of normal replacements, the renewals are practically uniform from year to year. For this reason, it is contended that such renewals should be treated as maintenance. This problem has recently received the attention of the Interstate Commerce Commission in its decisions on "Depreciation Charges of Telephone Companies" and "Depreciation Charges of Steam Railroad Companies." After an exhaustive consideration of forceful arguments on both sides of the question, the Commission decided[15] that such property should be the subject of depreciation accruals. The order of the Commission provides that averages may be used in identifying the ledger value of ties, rails, and ballast retired. The cost of "Track Laying and Surfacing," representing the labor expense incurred "in the application of ballast, ties, rails, and other track material," is charged to investment in road and equipment for the original work but to maintenance expense for renewals. The Commission recognizes this "as a departure from strict theory" but justifies it "by the practical difficulties of any different procedure." Thus the only extent to which fixed capital accounts will not show actual investment and any change in prices is for the labor cost incurred in making renewals of these items. The objectionable practices of the metropolitan street railway, cited above, should be definitely barred by this decision.

Relation between Maintenance and Depreciation

As has been suggested, the proper treatment of repairs cannot be decided without reference to depreciation policies. Both maintenance and depreciation

[15] Pages 360 and 366 of Orders 14,700 and 15,100.

tion have their independent functions, but they must be reviewed jointly in the administration of property. It is theoretically conceivable that every renewal of property—units or parts—might be recorded as a retirement and a new installation and thereby shown by the depreciation reserve. This would eliminate some of the problems in interpreting repair and renewal operations, but the practical difficulties and the additional accounting entries necessitated would outweigh the advantages of showing changes in components of property.

The Interstate Commerce Commission, in its "Tentative Classification of Operating Expenses for Steam Roads, Draft of October, 1926,"[16] establishes the inseparable relationship between repairs and depreciation.

> The accounts provided for maintenance are designed to show the cost of repairs and also the loss resulting from ordinary wear and tear of service, exposure to the elements, inadequacy, obsolescence, or other depreciation, or from fire, flood, or other casualty.

Depreciation rates depend largely upon policies followed in providing for and charging repairs. In accounting for renewals, repair charges begin where provision for depreciation stops. This is unconditionally true where unit rates are fixed. In this case, depreciation may advantageously be provided for parts of units when the parts are not renewed at comparatively short intervals or at a uniform rate. In establishing rates and in identifying parts and units subject to depreciation, a sharp line must be drawn between those renewals that are to be charged against the reserve and those to be treated as repairs. A utility just embarking upon its existence or rapidly expanding its plant will experience an initial period of low repair costs followed by a period of heavier outlays. The renewal of major parts or groups of minor parts might be provided for gradually by depreciation charges, and, when a renewal is effected, the entries might be made through the reserve without charging current maintenance.

When depreciation has no relation to the life of various classes of depreciable property but is based upon cubic feet of gas, or kilowatt hours of electricity sold, or the revenue from such sales—methods frequently employed — there can be no possible connection between accounting practice for renewals and the depreciation reserve. The distribution of expenditures becomes a hit or miss policy, and many large and important outlays are interpreted any way the management desires. Then accounting for repairs, renewals, and betterments becomes arbitrary, and uniformity becomes a mockery.

Need for More Active Accounting Regulation

The time has come when the regulation of utility accounts by public service commissions must be more active, vigilant, and penetrating. It is not enough to prescribe uniform classifications even though they are exhaustively written. Following the promulgation of classifications, there must be a vast amount of research for the purpose of formulating definite rules interpreting and enlarging upon the various accounts and definitions. Work by regulatory bodies in this field has been limited, for the most part, to passing upon individual cases as they arise either through commission investigation of particular companies or as a result of a commission's being called upon to give an interpreta-

[16] Sec. 208.

tion. The striking exception to this procedure has been the Interstate Commerce Commission studies and decisions on the depreciation charges of telephone companies and steam roads. But this is only one of the many fields in which the need for searching inquiry is urgent and must be satisfied if the much sought uniformity is to be attained and if accounting regulation is to be made effective.

Commissions are laboring in the dark in dealing with some of the most important problems involving accounting procedure because they do not have available a large store of information taken from the operating experience of utilities. Under existing conditions, when a case arises, an independent inquiry must be instituted, usually without the guidance of definite rules. There is no accounting problem that so urgently and insistently demands thorough and comprehensive research as that of specifically defining maintenance and capital charges. Utilities with a long operating history have doubtless accumulated a mass of information that lends itself to classification. The experiences and practices of various companies in recording capital and repair expenditures should be examined by commission accountants and engineers, and, in cooperation with representatives of the utilities, they should formulate rules of practice so specific as to comprehend almost every conceivable charge.

Because of the magnitude of such an undertaking, the limited financial means at the disposal of individual commissions, and the need of avoiding duplication of effort, this work could be more expeditiously and economically done by a special committee of accountants and engineers appointed by the National Association of Railroad and Utilities Commissioners. Subcommittees might be organized for the various types of utilities, as electric, gas, water, and so on, and pursue their inquiries in cooperation with similar committees representing the various utility associations. To insure consistent application to the work, the association of commissioners should organize a special staff of accountants and engineers to marshal the facts and present their interpretations. The members of the industry, ever alert, would doubtless organize such means as they found necessary to render effective cooperation. The public side must be equally well organized and financed.

It might be found that an investigation of maintenance and capital expenditures should be made hand in hand with a study of depreciation, or retirement, methods and rates. Certainly these two subjects are so closely related that policies with respect to one cannot be wholly divorced from the other.

One could not be so optimistic as to hope that the recommendations of such a committee would be accepted by all public service commissions, even though the recommended rules of practice were adopted by the National Association of Railroad and Utilities Commissioners. Nevertheless, such an investigation would make available a body of information that would be of inestimable service to commissions, utilities, and their accounting and engineering staffs.

THE RECENT RECESSION OF FARM POPULATION AND FARM LAND

By JACOB PERLMAN

THE general depression following the period of prosperity which reached its peak in the spring of 1920, did not strike all industries with equal severity. Agriculture suffered vastly more than most of the other industries. But this does not tell the whole story. Many of the non-agricultural industries had recovered from the depression by 1922 and since then, with some minor exceptions, have been unusually prosperous. Agriculture, however, has continued at low ebb and is still far from enjoying a sound economic condition.[1]

These phenomena are not difficult to explain. Most of the non-agricultural industries are well organized. In a measure they are able to control competition by regulating production and distribution, and thus to deflate and to bring about stabilization. The non-agricultural industries also received notable assistance from the government in the form of a higher tariff, a favorable discount policy by the Federal Reserve banks, and other valuable aids. In contrast to this, agriculture as a whole has thus far been unsuccessful in controlling competition by the regulation of production and distribution. This may be explained in part by the large ratio of fixed investment to operating expenses which compels farmers to continue operations regardless of low returns, because their only alternative is no return at all while taxes and interest charges continue to accumulate. The most important obstacle to control is the difficulty of developing voluntary cooperation on account of the large number of people engaged in agriculture and the isolated life they lead. Moreover, the Federal government has not come to the assistance of agriculture with special remedies, for the tariff and other aids granted to the non-agricultural industries have been of little help to farmers. As a result, agriculture found itself in a relatively helpless condition when deflation set in and has been forced to go through a period of recession, which is lessening the intensity of competition by the wasteful method of eliminating producers through bankruptcy. This process may eventually bring about limitation of supply and improved prices but in the meantime it is proving very costly to farmers.

The recession in agriculture since 1920 has been conspicuous in two respects: first, a decline in farm population, and second, a reduction of the area of land in agricultural use. The object of this article is to determine the extent of the recent changes in farm land and farm population and how these changes correlate with the trend in agricultural production and with the natural surplus of the farm population, all of which should be considered in shaping future policy with respect to the above factors to help stabilize agriculture.

Changes in Farm Population

The decline in farm population, either on a relative or absolute basis, did not

[1] For a description of the agricultural depression since 1920 and of its causes, see the articles by Henry C. Taylor and Jacob Perlman on "The Share of Agriculture in the National Income" in 3 *Journal of Land and Public Utility Economics* 145–162 and 432–433 (1927).

originate during the recent depression but may be traced back prior to 1920. Available data indicate that relatively the farm population has been decreasing for more than a hundred years, while absolutely it began to contract about 1910.

This interesting fact is brought out in Table I, which shows the percentage and number of persons gainfully employed in agriculture and other occupations at each census year from 1820 to 1920.[2] Until 1880, more than half of the workers gainfully employed were still to be found in agriculture but since then the majority of them have been in the non-agricultural industries. The absolute number of gainfully employed workers in agriculture continued to increase until 1910, but the census in the following decade showed a reduction of about 800,000. In contrast to this, the number of gainfully employed in other occupations has increased both relatively and absolutely since 1820. In other words, at each succeeding decade the country gradually became less agricultural and more industrial.

TABLE I. PER CENT. AND NUMBER OF PERSONS GAINFULLY EMPLOYED IN AGRICULTURE AND OTHER OCCUPATIONS AT EACH CENSUS YEAR, 1820–1920*

A	B	C	D
Year	All Occupations	Agriculture†	Other Occupations
A. PER CENT. OF PERSONS GAINFULLY EMPLOYED			
1920.....	100.0	26.1	73.9
1910.....	100.0	31.2	68.8
1900.....	100.0	36.8	63.2
1890.....	100.0	41.9	58.1
1880.....	100.0	48.9	51.1
1870.....	100.0	53.4	46.6
1860.....	100.0	59.7	40.3
1850.....	100.0	64.5	35.5
1840.....	100.0	68.6	31.4
1830.....	100.0	70.4	29.6
1820.....	100.0	71.9	28.1
B. NUMBER OF PERSONS GAINFULLY EMPLOYED (*Thousands*)			
1920.....	41,854	10,923	30,931
1910.....	37,454	11,704	25,750
1900.....	29,073	10,699	18,374
1890.....	23,319	9,770	13,549
1880.....	17,390	8,505	8,885
1870.....	12,927	6,904	6,023
1860.....	10,531	6,287	4,244
1850.....	7,697	4,965	2,732
1840.....	5,420	3,718	1,702
1830.....	3,940	2,773	1,167
1820.....	2,881	2,071	810

* Based on estimates of P. K. Whelpton, "Occupational Groups in the United States, 1820–1920," *Journal of the American Statistical Association*, pp. 339–340, September, 1926. These figures include persons ten years of age and over from 1850 to 1920 and persons "engaged in actual occupations" from 1820 to 1840.

† Exclusive of lumbering and fishing.

The absolute decline in the number of those gainfully employed in agriculture between 1910 and 1920 deserves further consideration. The unrevised census data of the number of persons 10 years of age and over gainfully employed in agriculture for 1910 and 1920, as shown in Table II, indicate a reduction of 1,723,107 or 13.9% between those two years. It should be noted that this resulted entirely from a decrease in the number of farm laborers, which amounted to 2,019,505 or 32.5%.[3] However, the

[2] Although these figures, which are a revision of the census data to make them more comparable from one decade to the next, constitute but rough approximations, they may nevertheless be depended upon to show the general trend.

[3] The Bureau of the Census offers several explanations for this decline. In the first place, a large part of the shrinkage may be charged to a change of the census data from April 15 in 1910 to January 1 in 1920. The busy season includes the month of April, when many workers are needed on the farms, but early in January there is very little work to be done and only a few workers are then to be found on farms. Consequently, many persons usually employed as farm laborers were not so enumerated in 1920. Also a large number of farm children between the ages of 10 and 15 were not working during the month of January and were not recorded as gainfully employed in 1920. In the second place, many farm laborers during the War left to enter the military service or were lured away to the cities by high wages, and most of them probably had not yet returned or been replaced at the time the 1920 census was taken. In the third place, a change of instructions issued to enumerators resulted in an overenumeration of child and women laborers on farms in 1910. *Fourteenth Census of the United States*, 1920, Vol. IV, Occupations, pp. 13–14 and 20–24.

number of farmers (owners and tenants) and farm managers and foremen increased between 1910 and 1920, according to the same table, the former by 254,370 or 4.2% and the latter by 42,028 or 83.6%. That these additions are real is shown by the fact that the number of farms also increased from 6,361,502 in 1910 to 6,448,343 in 1920, a gain of 86,841 or 1.4%.[4] Thus, it seems that the total reduction in the numbers of agricultural workers between 1910 and 1920 was not very great. Mr. Leon E. Truesdell estimates that, if both censuses had been made on corresponding dates and under the same instructions, the decrease would probably amount to about 200,000 or more persons.[5]

The decline in the number of gainfully employed persons in agriculture between 1910 and 1920 was accompanied by a larger decrease in farm population. The latter was enumerated for the first time in 1920.[6] The farm population so enumerated amounted to 31,614,269 in 1920.[7] Mr. Truesdell has estimated the farm population in 1910 at 32,076,960, which makes a decrease of 462,691 or 1.4% during the decade.[8] Some of the causes tending to reduce the number of those engaged in agriculture were probably also responsible for the decline in the farm population. According to the figures in Table IV, the percentage of the farm population in the total population decreased from 34.9 in 1910 to 29.9 in 1920, owing partly to the reduction in the farm population but largely to the considerable increase in the total population.

However, the first large reduction in the number of people on farms has taken place since 1920. This may be attributed almost entirely to the agricultural depression which has driven many farm people into non-agricultural pursuits. No figures are available since 1920 giving the number of persons gainfully employed in agriculture, but data on the changes in the number of farms and farm population show conclusively that during the last seven years there has been a considerable movement of people away from the farms.

[4] *Abstract* of the Fourteenth Census of the United States, 1920, p. 583. It will be seen that the increase in the number of farmers (owners and tenants) and farm managers and foremen was much greater than in the number of farms. For the relation between the two see Leon E. Truesdell, in *Census Monograph VI*, "Farm Population of the United States," 1920, p. 126.

[5] *Ibid.*, p. 124.

[6] As defined by the Bureau of the Census, "farm population" included "all persons actually living on farms, without regard to occupation, and also those farm laborers (and their families) who, while not living on a farm, nevertheless live in a strictly rural territory, outside the limits of any village or other incorporated place." *Fourteenth Census*, 1920, Agriculture, p. 891.

[7] *Ibid.*, p. 892.

[8] Leon E. Truesdell, *op. cit.*, pp. 43–46.

TABLE II. CHANGES IN NUMBER OF PERSONS TEN YEARS OF AGE AND OVER GAINFULLY EMPLOYED IN AGRICULTURE,* 1910–1920

OCCUPATION	1920*	1910†	INCREASE OR DECREASE	
			Number	Per Cent
All Agricultural Occupations	10,661,410	12,384,517	—1,723,107	—13.9
Farmers (owners and tenants)	6,382,958	6,128,588	+ 254,370	+ 4.2
Farm managers and foremen	92,324	50,296	+ 42,028	+83.6
Farm laborers	4,186,128	6,205,633	—2,019,505	—32.5

* These figures cover the same agricultural occupations included by Leon E. Truesdell in *Census Monograph VI*, "Farm Population of the United States, 1920," pp. 120–121. These occupations are included by the Bureau of the Census under "Agriculture, forestry, and animal husbandry," the ones excluded here being turpentine farmers, foremen and laborers, fishermen, foresters and 15 in all persons engaged in lumbering, and landscape gardeners.

† Based on data in *Abstract* of the Fourteenth Census, 1920, p. 483. These figures are as of January 1 in 1920 and as of April 1910.

The 1925 Census of Agriculture disclosed a decrease in the number of farms for the country as a whole for the first time in the history of America. The reduction was not universal, but it appeared in five of the nine geographic divisions into which the country is divided (Table III). In the United States as a whole the number of farms was reduced by 76,703 or 1.2%. This reduction appears to have been concentrated largely in the eastern rather than in the western part of the country. With the exception of New England, every geographic division east of the Mississippi River showed a decrease, while west of that river all but the Mountain states reported a gain. In some cases, notably in New England, the increase may be explained partly by a change in the census definition of "farm" which in 1925 omitted the qualification, "or which required for its agricultural operations the continuous services of at least one person,"[9] thus resulting in a large number of farms being reported where the owner spent most of his time in some occupation other than farming. In other cases, especially on the Pacific coast, the increase was due to the breaking up of farms into smaller units for truck farming and more intensive land cultivation. Many of the reductions were caused by the tendency in certain parts of the country to increase the size of the farm unit with the greater use of machinery, but in a majority of cases the decreases were no doubt the result of abandonment of farms, through foreclosure and other causes, which grew out of the depression in the industry.

However, the effect of the depression upon the industry is best disclosed by the large decrease in farm population since 1920, as shown by the 1925 Census of Agriculture. According to the final figures the farm population in 1925 amounted to 28,981,668,[10] but this figure must be revised before a comparison may be made with 1920. The 1925 Census of Agriculture considered only persons living on farms and left out "those farm laborers (and their families) who, while not living on farms, did live in rural territory outside any incorporated place."[11] No separate tabulation was made in 1920 of the latter group, but the Bureau of the Census estimates their number at 700,000 out of a total of 31,614,269 persons on farms.[12] Assuming

[9] *United States Census of Agriculture*, 1925, "Summary Statistics, by States," p. III.

[10] *Ibid.*, p. 52.

[11] *Ibid.*, vi.

[12] *Press Summary*, Bureau of the Census, May 4, 1927

TABLE III. CHANGES IN NUMBER OF FARMS, BY GEOGRAPHIC DIVISIONS, 1920–1925

DIVISIONS	NUMBER OF FARMS*		INCREASE OR DECREASE	
	1925	1920	Number	Per Cent
United States	6,371,640	6,448,343	—76,703	—1.2
Geographic Divisions:				
New England	159,489	156,564	+ 2,925	+1.9
Middle Atlantic	418,868	425,147	— 6,279	—1.5
East North Central	1,051,572	1,084,744	—33,172	—3.1
West North Central	1,111,314	1,096,951	+14,363	+1.3
South Atlantic	1,108,061	1,158,976	—50,915	—4.4
East South Central	1,006,052	1,051,600	—45,548	—4.3
West South Central	1,017,305	996,088	+21,217	+2.1
Mountain	233,392	244,109	—10,717	—4.4
Pacific	265,587	234,164	+31,423	+13.4

* *United States Census of Agriculture, 1925*, "Summary Statistics, by States," pp. 4–5.

that this group of farm laborers and their families represents the same proportion of the total number of people living on farms in 1925 as it did in 1920, the total farm population in 1925 as defined in the 1920 census may be estimated at 29,638,000. Compared with 1920, this seems to indicate a decrease of nearly 2,000,000 in five years, or at the rate of 400,000 per year. According to Table IV, the farm population constituted 25.9% of the total population in 1925 as compared with 29.9% in 1920. However, this drop in the percentage was not attributable entirely to the reduction of 2,000,000 in farm population but largely to the fact that the increase in the total population of the country during this period was nearly nine millions.

The decline in farm population after 1925 has not only continued without interruption, but it has been greatly accelerated, according to estimates made by the United States Department of Agriculture in 1926 and 1927. These estimates are computed from figures covering births, deaths, and arrivals to, and departures from, farms in 1925 and 1926. The data were obtained from a sample of farmers from all parts of the country, and correlated with the 1925 Census of Agriculture figure for the total population living on farms which was used as a base.

TABLE IV. PER CENT. OF FARM POPULATION IN TOTAL POPULATION IN 1910, 1920, and 1925

Year*	Total Population (Thousands)	Farm Population (Thousands)	Per Cent of Farm Population in Total Population
1925.....	114,553†	29,638§	25.9
1920.....	105,711‡	31,614 ‖	29.9
1910.....	91,972‡	32,077 ¶	34.9

* Figures are as of January 1 in 1925 and 1920 and as of April 15 in 1910.
† Estimate of the Bureau of the Census.
‡ *Abstract* of the Fourteenth Census of the United States, 1920, p. 16.
§ For method of estimation see text, p. 48–49.
‖ *Abstract* of the Fourteenth Census of the United States, 1920, p. 583.
¶ Estimate of Leon E. Truesdell, *Census Monograph VI*, "Farm Population of the United States, 1920," p. 45.

TABLE V. CHANGES IN POPULATION LIVING ON FARMS, BY GEOGRAPHIC DIVISIONS, DURING 1925*

Divisions	Population Living on Farms on January 1 (Thousands)		Decrease	
	1925†	1926‡	Number (Thousands)	Per Cent.
United States.....	28,982	28,541	441	1.5
Geographic Division:				
New England.....	658	651	7	1.1
Middle Atlantic.....	1,818	1,808	10	0.6
East North Central.....	4,511	4,425	86	1.9
West North Central.....	4,924	4,826	98	2.0
South Atlantic.....	5,661	5,531	130	3.3
East South Atlantic.....	4,632	4,586	46	1.0
West South Atlantic.....	4,736	4,727	9	0.2
Mountain.....	1,012	973	39	3.9
Pacific.....	1,030	1,014	16	1.6

* These figures do not include farm laborers and their families not living on farms.
† *United Census of Agriculture, 1925*, "Summary Statistics, by States," pp. 52–53.
‡ *Press Summary*, United States Department of Agriculture, April 20, 1927, p. 3.

The figures for 1925 show a net loss of 441,000 in the population living on farms during that year, or a drop of 1.5% (Table V). Each one of the geographic divisions shows a reduction during the year, the largest ones appearing in the South Atlantic, West North Central and East North Central States. If we do not take into consideration births and deaths, the movement of the population living on farms for the United States as a whole was even greater than indicated above. In 1925 the gross movement from farms amounted to 1,900,000 and the gross movement to farms 1,066,000, thus making a net movement of 834,000 away from farms.[13]

In 1926 the situation was even worse than in the previous year, as evidenced by the data in Table VI. Considering only the gross movements from and to farms, the net loss by migration amounted to 1,020,000. On the other hand the excess of births over deaths on farms

[13] *Press Summary*, United States Department of Agriculture, April 20, 1927, p. 1.

TABLE VI. CHANGES IN POPULATION LIVING ON FARMS, BY GEOGRAPHIC DIVISIONS, DURING 1926*

DIVISIONS	POPULATION LIVING ON FARMS, JANUARY 1, 1926 (Thousands)	ARRIVALS (Thousands)			DEPARTURES (Thousands)			DECREASE		POPULATION LIVING ON FARMS, JANUARY 1, 1927 (Thousands)
		Births	From Cities, Towns and Villages	Total	Deaths	To Cities, Towns and Villages	Total	Number (Thousands)	Per Cent.	
United States	28,541	658	1,135	1,793	287	2,155	2,442	649	2.3	27,892
Geographic Divisions:										
New England	651	13	52	65	8	72	80	15	2.3	636
Middle Atlantic	1,808	38	101	139	24	155	179	40	2.2	1,768
East North Central	4,425	88	164	252	35	319	354	102	2.3	4,323
West North Central	4,826	87	193	280	39	338	377	97	2.0	4,729
South Atlantic	5,531	144	133	277	61	354	415	138	2.5	5,393
East South Central	4,586	138	101	239	50	266	316	77	1.7	4,509
West South Central	4,727	118	194	312	52	402	454	142	3.0	4,585
Mountain	937	20	95	115	9	130	139	24	2.5	949
Pacific	1,014	12	102	1,114	9	119	128	14	1.4	1,000

* *Press Summary*, United States Department of Agriculture, April 20, 1927, p. 3. These figures do not include farm laborers and their families not living on farms.

produced a natural increase of 371,000. Thus the total departures from farms exceeded total arrivals, counting births and deaths, by 649,000 or 2.3%. This decline appears to have been more or less uniform in all the geographic divisions.

The population living on farms was 28,541,000 on January 1, 1926, and 27,892,000 on January 1, 1927. These figures do not take into account the number of farm laborers and their families not living on farms. Assuming that the proportion of this group to those living on farms was the same in 1925 and 1926 as in 1920, the total farm population may be estimated at 29,187,000 on January 1, 1926 and 28,524,000 on January 1, 1927. The estimated total population in the country was 116,257,000 on January 1, 1926 and 117,882,000 on January 1, 1927,[14] of which the total farm population represented 25.1% and 24.2% respectively, on those dates.

In other words, since 1910 the farm population has declined more than three and one-half millions, while the total population of the country has increased about 26 millions. Since 1920 the total farm population has decreased by more than three millions, while the total population in the United States has gained more than 12 millions.

Changes in Agricultural Land

The changes in agricultural land have been somewhat different from those in farm population. Until 1920, farm acreage followed continually an upward trend, but since then the movement on the whole has been in the opposite direction.

The expansion in agricultural land prior to 1920 consisted of three different phases. At first the increase was caused by the rapid settlement of the western country, which grew out of the relative over-population in the eastern states, the inability of the poor soil to supply adequate food and raw materials, and the liberal policy of the Federal government in distributing land to settlers.

The movement continued until the disappearance of the fertile parts of the national domain. Then the expansion of agricultural land, encouraged by increases in demand for food products and raw materials as a result of the rapid industrial development, caused the occupation of less desirable land or fertile land made available by private or public

[14] Furnished by the Bureau of the Census.

reclamation projects prompted by the conservation movement. This process continued until recently. Finally, there was the expansion of the agricultural area during the War period under the stimulus of patriotic appeals and the high prices of farm products. This brought about the climax in the expansion of agricultural land in 1920.

In Table VII one may see the increases from one census year to the next between 1850 and 1920 in the acreage of all land in farms and improved land.

TABLE VII. CHANGES IN ACREAGE OF FARM LAND, 1850–1925

YEAR	ALL LAND IN FARMS		IMPROVED LAND	
	Acres (Thousands)	Per Cent. of Change during Decade	Acres† (Thousands)	Per Cent. of Change during Decade
1925..	924,319*	— 3.3	.....	.....
1920..	955,884†	+ 8.8	503,073	+ 5.1
1910..	878,798†	+ 4.8	478,452	+15.4
1900..	838,592†	+34.6	414,498	+15.9
1890..	623,219†	+16.3	357,617	+25.6
1880..	536,082†	+31.5	284,771	+50.7
1870..	407,735†	+ 0.1	188,921	+15.8
1860..	407,213†	+38.7	163,111	+44.3
1850..	293,561†	.....	113,033	.....

* *United States Census of Agriculture, 1925*, "Summary Statistics, by States," p. 4.
† *Abstract* of the Fourteenth Census of the United States, 1920, p. 584.

During the 70 years the acreage of all land in farms has more then trebled and that of improved land has more than quadrupled. It should be noted that the increases became smaller toward the end of the period. For the total acreage of crop land harvested there are no comparable census data going back to 1850, but what information is available indicates that this trend was similar to those found in the above data.

The importance of the expansion in agricultural land during the War period justifies the examination in greater detail of the changes that have occurred between 1910 and 1920. Table VIII shows the changes in acreage during that decade by kinds of farm land. The decreased acreage of woodland was more than offset by the increased acreage of improved land and especially of unimproved land. In other words, the changes occurring during this decade indicate a considerable lowering of the margin of cultivation. Not only were large acreages added to the agricultural area, but a great deal of woodland and other unimproved land was put into higher uses and classified as improved land.

The most important changes in the utilization of agricultural land during this decade occurred in crop land. As shown by the figures for land harvested in certain crops the acreage of wheat increased from 44,262,592 in 1909 to 73,099,421 in 1919 (a gain of 65.1%), rye from 2,195,561 acres to 7,679,005 acres (249.8%), and hay and forage, excluding corn cut for silage, from 72,402,173 to 81,618,296 (12.7%).[15] A part of these

[15] *Abstract* of the Fourteenth Census, 1920, p. 810. The increase in hay and forage does not include 14,502,932 acres reported for corn cut for forage, which was nearly all duplicated in the acreage shown for corn harvested for grain.

TABLE VIII. CHANGES IN ACREAGE OF FARM LAND, 1910–1920*

ITEM	1920 (January 1)	1910 (April 15)	INCREASE OR DECREASE	
			Amount	Per Cent.
	Acres	Acres	Acres	
All land in farms	955,883,715	878,798,325	+77,085,390	+ 8.8
Improved land	503,073,007	478,451,750	+24,621,257	+ 5.1
Woodland	167,730,794	190,865,553	—23,134,759	—12.1
Other unimproved land	285,079,914	209,481,022	+75,598,892	+36.1

Abstract of the Fourteenth Census of the United States, 1920, p. 583.

enormous increases was balanced by reduction of the acreage of other crops, but most of the expansion may be traced to the turning of pasture and other land into crop land. According to O. E. Baker, about 40,000,000 acres of pasture land were plowed and put into crops and about 5,000,000 acres of forest land were cleared for crops between 1909 and 1919. He says further: "Had there been the same rate of increase as during the previous decade relative to the increase of population, only about 23,000,000 acres additional crop land would have been brought into cultivation. As the trend of per capita acreage of crops required for domestic consumption was practically the same in the decade 1909–1919 as in that of 1899–1909, it would appear that nearly half of the 45,000,000 acres increase in crop acreage during the decade, 1909–1919, was used to meet the increased demand from Europe."[16] Thus the overexpansion may be attributed largely to the War.

With the post-War decline in the demand for agricultural products accompanied by low prices, the downward trend in the acreage of agricultural land appearing in the 1925 Census of Agriculture is natural. Not only was there a reduction in the acreage of all land in farms, but radical changes also occurred in the utilization of land. Unfortunately, the classification of farm land was changed in 1925, which makes it possible only to compare the 1925 and 1920 acreages for all land in farms and roughly for crop land and woodland.

Table IX presents the changes in acreage of all land in farms between 1920 and 1925 for the country as a whole and for each of the geographic divisions. With the exception of the Mountain states, there was a decrease in every geographic division, the reduction in the United States as a whole amounting to 3.3%. The increase in the Mountain states may be attributed largely to an expansion in the sheep raising industry, while in the other geographic divisions the reductions were the result of the depression in the agricultural industry as a whole.

The decline in the acreage of crop land harvested for the United States as a whole between 1919 and 1924, according to O. E. Baker, was from about 363 to 344 millions, which is a drop of about 5%. This land reverted to pasture or

[16] O. E. Baker, "Changes in the Utilization of Land in the United States," 1919–1924. A Preliminary Report. June, 1926, p. 3. Published by the United States Department of Agriculture.

TABLE IX. CHANGES IN ACREAGE OF ALL LAND IN FARMS, BY GEOGRAPHIC DIVISIONS, 1920–1925

DIVISIONS	1925*	1920*	INCREASE OR DECREASE	
			Number	Per Cent.
United States	924,319,352	955,883,715	—31,564,362	— 3.3
Geographic Divisions				
New England	15,857,927	16,990,642	— 1,132,715	— 6.7
Middle Atlantic	37,490,939	40,572,901	— 3,081,962	— 7.6
East North Central	112,752,458	117,735,179	— 4,982,721	— 4.2
West North Central	248,081,143	256,973,229	— 8,892,086	— 3.5
South Atlantic	88,569,458	97,775,243	— 9,205,785	— 9.4
East South Central	70,606,625	78,897,463	— 8,290,838	—10.5
West South Central	165,013,316	173,449,127	— 8,435,811	— 4.9
Mountain	131,689,374	117,337,226	+14,352,148	+12.2
Pacific	54,258,112	56,152,705	— 1,894,593	— 3.4

* *United States Census of Agriculture, 1925*, "Summary Statistics by States," pp. 4–5.

was allowed to lie idle. He also estimates that during the same period the total acreage of forest, cut-over land and woodland was increased by about 9,000,000 which shows that nearly one-half of the increase in pasture and idle crop land was offset by this reversion to woodland and brush.[17] The crops that showed the greatest reductions in harvested acreage were those that were expanded most during the War period. The acreage of wheat declined from 73,099,421 in 1919 to 50,862,230 in 1924 (a decrease of 30.4%); rye decreased from 7,679,005 to 3,743,562 acres (51.2 %); and all hay crops, excluding corn cut for forage, decreased from 81,618,296 acres to 74,095,942 (9.2%).[18] These reductions, which, together with smaller decreases in other crops, were partly offset by increases in a number of crops, are responsible for the large decline in the harvested acreage of crops between 1919 and 1924.[19]

Trend of Agricultural Production

A study of the changes in farm population and agricultural land naturally leads to an examination of the trend of the volume of agricultural production, which depends on the number of people and the amount of land employed in the

[17] *Ibid.*, p. 2. The above figures are only approximate. The 1919 data for acreage of harvested crops are a total of the individual crops with allowances for duplication of corn for grain and corn for forage, based on data collected by the United States Department of Agriculture, and also with allowances for double cropping, whereas the 1924 data are taken directly from a tabulation of "land in crops harvested in 1924." The estimate of the increase in forest, cut-over and woodland is based on changes in the census data of woodland in farms and total farm area in the states from Minnesota to Louisiana and eastward.

[18] *Census of Agriculture*, 1925, "Summary Statistics, by States," p. 38.

[19] The only data on agricultural land available since 1925 are those for crop acreage harvested, which are collected by the crop reporting service of the United States Department of Agriculture. These figures indicate an increase in crop acreage, but the total is still considerably below that of the high figure of 1920.

TABLE X. RATIO OF THE TOTAL POPULATION OF THE UNITED STATES AND OF THE NUMBER OF ACRES IMPROVED LAND IN FARMS TO THE NUMBER OF PERSONS GAINFULLY EMPLOYED IN AGRICULTURE, BY DECADES, 1820 TO 1920

A	B	C	D	E	F
Year	Number of Persons Gainfully Employed in Agriculture* (Thousands)	Total Population of the United States† (Thousands)	Ratio of Total Population to Number of Persons Gainfully Employed in Agriculture C ÷ B	Number of Acres of Improved Land in Farms‡ (Thousands)	Ratio of Number of Acres of Improved Land in Farms to Number of Persons Gainfully Employed in Agriculture E ÷ B
1920	10,923	105,711	9.7	503,073	46.1
1910	11,704	91,972	7.9	478,452	40.9
1900	10,699	75,995	7.1	414,498	38.7
1890	9,770	62,948	6.4	357,617	36.6
1880	8,505	50,156	5.9	284,771	33.5
1870	6,904	38,558	5.6	188,921	27.4
1860	6,287	31,443	5.0	163,111	25.9
1850	4,965	23,192	4.7	113,033	22.8
1840	3,718	17,069	4.6	.....	.....
1830	2,773	12,866	4.6	.....	.....
1820	2,071	9,638	4.7	.....	.....

* See Table 1, Column C.

† *Abstract* of the Fourteenth Census of the United States, 1920, p. 16. The enumeration of 1870 was incomplete in the Southern States.

‡ *Ibid.*, p. 584.

industry. Farm population must be considered with respect to the number of workers, their skill, and their knowledge of the work, and the agricultural area must be considered as to its amount and the quantity of capital applied to it. If the aim of the nation is to maintain at least enough agricultural production to satisfy the needs of the country, this has been accomplished. More than enough has been produced in the past to meet our own needs, and this with a relative, and lately an absolute, decrease in farm population coupled in recent years with a reduction in agricultural area. This indicates a gradual increase in the efficiency of agricultural production.

Table X presents two rough indexes of the efficiency of those engaged in agriculture for a number of decades prior to 1920. One index shows the ratio of the total population of the United States to the number of persons gainfully employed in agriculture, or the number of people in the total population supported by one gainful worker in agriculture. According to the data in column D, this figure increased from 4.7 in 1820 to 9.8 in 1920. It more than doubled within that century. It will be seen that the ratio remained almost stationary until about 1860, but thereafter it rose continuously, the largest increase having occurred between 1910 and 1920. The other index shows the ratio of the number of acres of improved land in farms to the number of persons gainfully employed in agriculture, or the number of acres of improved land taken care of by one gainful worker in agriculture. As shown in column F, this figure increased from 22.8 in 1850 to 46.1 in 1920. It more than doubled in 70 years. Here also the increase has been without interruption since 1850 and was fairly large between 1910 and 1920.

Rough index numbers of the physical volume of production of the principal crops by decades since 1849 appear in Table XI. They show a rapid rise from one decade to the next with the figure for 1919 nearly five and one-half times as

TABLE XI. INDEX NUMBERS OF PHYSICAL VOLUME OF PRODUCTION OF THE PRINCIPAL CROPS, BY DECADES, 1849–1919*
(1849=100)

YEAR	INDEX NUMBERS OF PHYSICAL VOLUME OF PRODUCTION
1919	541.0
1909	525.6
1899	474.1
1889	395.1
1879	275.9
1869	164.3
1859	154.0
1849	100.0

* Based on census data of the total production in pounds of corn, wheat, oats, barley, rye, buckwheat, rice, hay, white potatoes, sweet potatoes, tobacco and lint cotton. Tobacco and cotton were given a weight of ten each.

TABLE XII. INDEX NUMBERS OF PHYSICAL VOLUME OF PRODUCTION IN AGRICULTURE, 1909–1926
(Average for 1910–1914=100)

YEAR AND PERIOD	INDEX NUMBERS OF THE UNITED STATES DEPARTMENT OF AGRICULTURE OF THE MASS OF CROP PRODUCTION*		DAY'S ANNUAL UNADJUSTED INDEX NUMBERS OF THE PHYSICAL VOLUME OF PRODUCTION†	
	Total	Per Capita	Agricultural Products	Animal Husbandry
1909	94	99	93	101
1910	97	101	96	91
1911	91	92	91	106
1912	110	109	108	103
1913	95	95	96	102
1914	107	104	108	98
1915	116	109	114	105
1916	100	93	100	114
1917	108	100	106	113
1918	107	98	107	126
1919	108	98	109	122
1920	117	104	119	112
1921	100	88	98	116
1922	110	96	109	125
1923	110	94	110	139
1924	111	94	108	142
1925	112	94	110	136‡
1926	114	94	114	135‡
1909–1914	99	100	99	100
1915–1920	109	100	109	115
1921–1927	110	93	108	132

* "Yearbook of Agriculture," 1926, p. 1203. Based on the production of wheat, corn, oats, barley, rye, buckwheat, potatoes, hay, tobacco and cotton with the figure for each crop year multiplied by a constant price and divided by the average aggregate of base years.

† Based on data furnished by the Harvard Bureau of Economic Research, the base having been shifted from 1919.

‡ Preliminary figures.

large as for 1849. During the same period the number of workers for wages in agriculture little more than doubled, although the total population of the United States and the number of acres of improved land in farms increased about four and one-half times. The same story is told by the index numbers of the physical volume of agricultural production, which are shown by years from 1909 to 1926 in Table XII. In spite of the reduction in farm population between 1910 and 1920, a considerable increase appears in the physical volume of production of crops and animal husbandry. Both the index numbers of the United States Department of Agriculture of the total mass of crop production and Day's unadjusted index numbers of the physical volume of agricultural products show an increase of about 10% during the War period, 1915–1920, as compared with the pre-War period, 1909-1914. The increase between these periods in Day's unadjusted index numbers of the physical volume of production in animal husbandry amounted to 15%. Even after 1920, when the farm population decreased enormously and agricultural acreage shrank considerably, the physical volume of production of crops maintained the high point reached during the War period, while the physical volume of production in animal husbandry increased about 15% as compared with the War period. The index numbers of the United States Department of Agriculture of the mass of crop production per capita, which also appear in Table XII, have shown a tendency to decline, but this tendency would doubtless be counteracted if the increase in animal husbandry were taken into account.

The upward trend in agricultural production during the past century, in spite of a relative and lately an absolute decline in farm population and a recent reduction in the agricultural area, was made possible by the continued increase in agricultural efficiency resulting from a better knowledge of agriculture on the part of farmers and the use of more capital. The American farmer has gradually become more scientific. The development of scientific knowledge in agriculture may be said to have begun with the establishment of land grant colleges by the Federal government, and was continued by spreading that knowledge among farmers through schools and colleges, special courses and literature. Agricultural research, which has always received generous support from Federal and state governments, is also greatly responsible for the enormous increase in production. The increased use of capital has taken the form of more machinery, fertilizer, and other improvements. Agricultural machinery first became important with the invention of harvesting machines about the middle of the last century, and since then agriculture has gradually become more and more mechanized. This mechanization assumed a more rapid pace about 1910 and has been greatly accelerated during recent years. The farm tractor, which is displacing the horse and reducing human labor, has been particularly responsible for the increase in agricultural production. The number of tractors on farms increased 105.6%[20] between 1920 and 1925. The value of farm equipment sold by manufacturers in the United States was $277,924,547 in 1924, $340,271,234 in 1925, and $364,751,042 in 1926,[21] which makes a gain of 22.4% between 1924 and 1925 and a gain of 7.2% between 1925 and 1926. A similar

[20] *Abstract* of the Fourteenth Census, 1920, p. 748, and *Census of Agriculture*, 1925, "Summary Statistics, by States," p. 16.

[21] Bureau of the Census, "Manufacture and Sale of Farm Equipment," 1926, p. 4.

upward movement has also taken place in the use of fertilizer and other improvements.

There is no doubt that the education of farmers in better methods of farming and the use of capital in agriculture will spread at a greater rate in the future than it has in the past, thus making it possible to maintain agricultural production in proportion to the needs of the country with an even smaller farm population and less agricultural land. In other words, each year up to a certain point one may expect a small part of the farm population and agricultural land to go out of employment as a result of increased efficiency in agriculture.

Natural Surplus of Farm Population

The number of the farm population and the area of agricultural land that are thrown out of employment each year because of increased efficiency in agricultural production are relatively small and the problem of their absorption is comparatively easy. But other factors complicate the problem. The large excess of births over deaths among those living on farms maintains a natural surplus of farm population, and a decreasing demand for agricultural products results in a surplus of agricultural land in use. This decreased demand may be traced to contraction of both foreign and home markets for agricultural products, partly as a result of the greatly increased efficiency and mechanization of non-agricultural industries and the coincident restriction of foreign immigration.

The belief has long been established that the rural population is the seed-bed of the nation, which means that the surplus of the population in the country flowing into the cities is essential to replenish the urban population stocks that are constantly depleted by the sterilizing influences of city life. This belief has found expression in the writings of many persons. For example, Emerson says: "The city is recruited from the country. The city would have died out, rotted and exploded long ago but that it was reenforced from the fields. It is only the country which came to town the day before yesterday that is the city and court today."[22]

This statement is greatly exaggerated. It is a fact that the cities produce a surplus large enough to maintain and even to increase their population, but it is also true that the surplus produced

[22] *Prose Works*, Volume I, p. 482, quoted from p. 177 of the "New Era" by Josiah Strong.

TABLE XIII. BIRTH AND DEATH RATES AND NUMBER OF BIRTHS PER 100 DEATHS, EXCLUSIVE OF STILLBIRTHS, IN THE TOTAL REGISTRATION AREA, CITIES AND RURAL DISTRICTS, 1921–1924

YEAR	TOTAL REGISTRATION AREA			CITIES*			RURAL DISTRICTS*		
	Rate per 1000 Population†		Births per 100 Deaths	Rate per 1000 Population†		Births per 100 Deaths	Rate per 1000 Population†		Births per 100 Deaths
	Births	Deaths		Births	Deaths		Births	Deaths	
1924‡	22.6	11.8	192	22.8	12.5	182	22.4	11.1	202
1923§	22.4	12.4	181	22.3	12.9	173	22.5	11.9	189
1922"	22.5	11.9	189	22.2	12.4	178	22.8	11.3	202
1921¶	24.3	11.7	208	24.0	12.2	196	24.7	11.2	220

* The term "cities" indicates municipalities of 10,000 inhabitants or more in 1920, the remainder of the state being included in "rural" districts.
† Rates are based on population as estimated on July 1 of each year.
‡ "Birth, Stillbirth, and Infant Mortality Statistics for the Birth Registration Area of the United States," 1924, p. 50.
§ *Ibid.*, 1923, p. 44.
" *Ibid.*, 1922, p. 60.
¶ "Birth Statistics for the Birth Registration Area of the United States," 1920, p. 44.

in the rural territory is much larger than in urban communities. This is brought out by the data compiled in Table XIII which shows the birth and death rates and the number of births per 100 deaths, exclusive of stillbirths, in the total registration area, by cities and rural districts from 1921 to 1924. The birth rate per 1000 in the rural districts is about the same as in the cities, but the death rate per 1000 is much higher in the latter than in the former. Consequently, the number of births per 100 deaths in rural districts is considerably greater than in the cities, which means that there is a larger surplus in the country than in urban communities.

It is true that the rural districts, as defined in this table, include the farm population as well as all people living in communities up to 10,000 population, but other data point to the fact that a correspondingly large surplus is produced by the farm population strictly considered. According to estimates made by the United States Department of Agriculture on the basis of a representative sample of farm families for 1922, 1924, 1925 and 1926, in connection with changes in the number of people living on farms, the number of births was more than twice as large as the number of deaths in the farm population. Thus, in 1926, the number of births was estimated at 658,000 and the number of deaths at 287,000, which leaves a natural increase of 371,000 persons on farms.[23] If we estimate the number of persons living on farms on July 1, 1926 at 28,217,000,[24] it means a birth rate of 23.3 and a death rate of 10.2 per 1000 for that year. The number of births per 100 deaths thus amounted to 229, which indicates a much larger natural surplus than appears for the cities or rural districts of the registration area on the basis of the data in Table XIII.

Table XIV. Percentage Distribution of Farm, Village, and Urban Population, by Age Groups, in 1920*

Age Group	Percentage Distribution			
	Total	Farm	Village	Urban†
All ages	100.0	100.0	100.0	100.0
Under 9 years	21.7	25.8	22.8	19.0
10 to 19 years	19.0	23.1	18.6	16.8
20 to 44 years	38.4	31.9	36.7	42.7
45 to 64 years	16.1	14.8	15.8	17.0
65 years and over	4.7	4.5	6.1	4.4
Age unknown	0.1	0.1	0.2	0.2

* Based on census data compiled by Leon E. Truesdell, *Census Monograph V*, "Farm Population of the United States," 1920, p. 68.
† Excludes urban farm population.

Table XV Average Number of Children Born to the Past and Present Generation, by Occupations *

Occupations	Average Number of Children Born per Family		
	Present Generation		Past Generation of Fertile Families Only
	Fertile Families Only	Including Infertile Families	
All Occupations	3.36	2.92	5.44
Farmers	4.24	3.81	5.94
Unskilled laborers	3.75	3.24	6.67
Skilled laborers	3.28	2.80	4.96
Professional men	3.19	2.86	5.51
Business men	2.91	2.48	4.78
Clerical workers	2.61	2.07	4.21

* R. E. Baker and E. A. Ross, "Changes in the Size of American Families in One Generation," *University of Wisconsin Studies in the Social Sciences and History*, No. 10, 1924, p. 83. This study was based on 750 families of a generation ago and 2500 of the families of their descendants in this generation and was limited to people of American stock.

The same conclusion may be drawn from the figures shown in Table XIV, which gives the percentage distribution of farm, village, and urban population by age groups in 1920. It will be seen that under 20 years of age the percentages are greater in the farm population than in the village and urban populations, while above 20 years the percentages are greater in the village and urban populations than in the farm population. In other words, relatively more children are to be found on farms than in villages and cities, but as soon as they grow up

[23] United States Department of Agriculture, *Press Summary*, April 20, 1927, p. 1.

[24] An arithmetic mean of the population as estimated on January 1, 1926 and on January 1, 1927. *Ibid.*, p. 3.

and their productive life begins they flock to the urban centers. Table XV shows the average number of children born to the present and past generations by occupations. Although the average number of children born per fertile family among farmers declined from 5.94 in the past generation to 4.24 in the present generation, the latter figure was larger than that reported for each of the other occupations in the same generation.

Conclusion

Discussion of remedies for the agricultural depression frequently has overlooked or but scantily referred to the surpluses of farm land and farm population. Yet these basic factors cannot be ignored in any proposal asserted as a practical one. The surplus of agricultural land may prove to be temporary, if we consider a long enough stretch of time, or it may prove to be rather easily controlled. But the natural surplus of farm population does not lend itself so easily to measures of social control. Although this surplus seems to be decreasing, the task of distributing the excess of manpower is bound to be a continuing one. Moreover, the intelligent guidance of a labor surplus is doubly hard, not only because human beings, with their hopes, prejudices, habits and customs, are involved, but also because the direction of surplus farm labor cannot be dissociated from the similar problems of non-agricultural industries.

In short, the twofold task of reducing or re-directing the farm land and labor surpluses requires not temporary expedients but carefully considered plans looking far into the future. In formulating such statesmanlike policies, the quantitative measurement of these factors, as given above, is a definite basis for planning.

GOING VALUE: ITS VARIOUS INTERPRETATIONS AND THEIR VALIDITY

By JOHN D. SUMNER

GOING value is an intangible item in public utility valuation which has attracted widespread attention and discussion. Yet today it remains one of the seemingly insoluble and least understood elements encountered in the development of principles of rate-making valuation. Indeed, it may accurately be designated the most intangible of the many intangible elements encountered in valuation cases. As the situation is described in a typical statement, "There is no element in public utility valuation as to which there is greater vagueness and confusion than this so-called going concern value. The courts recognize that some value ought to be added to a going concern over the bare bones of its physical structure, but they do not seem clear as to how much should be added or on what basis the amount to be added should be ascertained."[1]

The writer's purpose in the following pages is first of all to classify and illustrate the more significant of the various constructions which have been made of the term "going value" in valuation cases; and second, to analyze and interpret from an economic point of view the logical application of these uses of the term. No attempt will be made to analyze the present status of going value at law,[2] except insofar as court cases may serve to illustrate various attitudes toward the problem and methods of treating it.

What is Going Value?

The first question which logically presents itself, therefore, concerns the nature of going value. The matter of definition is vital to the discussion of most problems in economics. As we have seen, the many ways in which going value has been construed make definition a particularly essential point of departure in this study.

I have adopted the following classification of the meanings in which the term has been employed as being most useful and representative. However, it should not be considered a complete index of definitions.[3] Going value has been described: (1) as an element similar to, if not identical with, good-will; (2) as simply that intangible attribute of a public utility which is established and successfully operating, with a profitable business and customers attached, compared with a utility which has not yet "won its spurs;" (3) as a differential: (a) between the market or sales value of a public utility and its appraised value as a successfully operating physical entity, or (b) between its appraised value as a successfully operating physical entity and the sum of the appraised values of the various distinct and *separable items* of tangible property; and (4) as an amount representing the necessary deficits sustained, or "income necessarily

[1] *Re Marin Municipal Water Dist.* (Cal.), P. U. R. 1915 C 433, 471.

[2] For a recent and careful survey and interpretation of going value decisions of the United States Supreme Court, see E. W. Bemis, "Going Value in Rate Cases in the Supreme Court," 27 *Col. Law Rev.* 530 (1927).

[3] An excellent discussion of the various senses in which going value has been employed is to be found in *City of Springfield v. Springfield Gas & El. Co.*, P. U. R. 1916 C 281, 358 (Ill. Commerce Com.).

foregone" by a utility, during its developmental period.[4]

Going Value as Good-Will

In the maze of judicial opinions regarding valuation for rate-making purposes, there is no term which is apparently more uniformly construed than "good-will." Good-will is universally excluded, at least when that label is attached. Judicial opinion in regard to its allowance is well expressed in *Wilcox* v. *Consolidated Gas Co.*[5] "We are of the opinion that it is not a case for a valuation of 'good-will' . . . The complainant has a monopoly in fact, and a consumer must take gas from it or go without. He will resort to the 'old stand' because he cannot get gas elsewhere. The court below excluded this item, and we concur in that action."

An even more logical basis for excluding good-will from rate-making valuations may be found. Good-will is ordinarily considered an item of value because it represents a factor of additional earning power. Other things being equal, a company with good-will earns more than a company without good-will. But in a rate-making valuation, when a basis for earnings is to be determined, to allow any item which depends upon earning power for its amount and validity is clearly to indulge in circular reasoning. A cause of earning power should not be used as a basis for earnings.

It is interesting, however, to note some of the opinions in which going value is allowed, and attempt to discover any difference in fact between it and the old good-will idea. For example, in discussing the Indianapolis Water Company in a recent decision,[6] the United States Supreme Court quotes with apparent approval the Indiana Commission: "Any reasonable man with a knowledge of this property and the local conditions would unhesitatingly affirm that it had a value far in exces of the value of the pipe, buildings, ground and machinery. Consider its earning power with low rates, *the business it has attached, its fine public relations, its credit,* the way the property is planned and is being extended with the future needs of the city in view, its operating efficiency and standard of maintenance, its desirability as compared with similar properties in other cities and with other utilities of comparable size in this city. These things make up a value that is real and not speculative. *It would be considered by a buyer or seller of the property or by a buyer or seller of its securities.*" (*Italics ours.*) The court then reproves the Commission for not making sufficient allowance for going value. None of these items is termed good-will, but some sound suspiciously like it.

The common statement that going value is an item always present in the case of a successful public utility[7] leads the New York Public Service Commission to remark in a recent decision:[8]

[4] It has been suggested as a result of recent court decisions that going value is simply a concept which may prove useful to commissions and regulatory bodies in dispensing equity in valuation—an intangible something which may be added or refused at the discretion of the legislature or its agent to deal out justice in hard cases. See M. G. Glaeser, "Some Aspects of the Going Value Concept," 1 *Journal of Land and Public Utility Economics*, 435–443 (October, 1925).

[5] 212 U. S. 19, 52.

[6] *McCardle v. Indianapolis Water Co.*, 272 U. S. 400, 414 (1926).

[7] E. g. *City of Springfield v. Springfield Gas & El. Co.*, 291 Ill. 209; 125 N. E. 891 (1919); *New York Telephone Co. v. Prendergast*, 300 Fed. 822, P. U. R. 1925 A 491, 497, in which the court gives a rather naive discussion of going value, concluding that "it is found that this plaintiff was created and does function, and functions very well; therefore it has going value, because it goes well. The amount may be difficult of ascertainment, but that going value exists is self-evident."

"This theory of allowing going value because a utility goes well fails to comprehend the difference between regulative public utility business and general business. It apparently defines going value as good-will, which may attach to a successful business other than a utility."

These illustrations show the tendency in valuation cases to allow for going value in a sense that is remarkably similar to good-will, although it is never given that designation. Other illustrations of a similar nature will be introduced in subsequent pages.[9]

Going Value as the Attribute of a Utility Organized and in Successful and Profitable Operation

This construction of the subject is difficult to analyze. It may be our friend good-will in disguise. It may, in fact, represent valuation on the basis of earning power. It may mean exceptional management and efficiency, or it may represent a confused nothing.

It would be fruitless here to illustrate all the different turns and connotations of going value of this general nature which are found in the decisions of various courts and commissions. As has been said in a recent commission case,[10] "What is going value appears to be in a nebulous state so far as it can be determined from the decisions of many courts and commissions." A few examples will reveal how meaningless are some of these statements.

One commission, after refusing to make any going value allowance on the basis of early losses, goes on to say: "We do feel that we should give consideration to the difference in the value of the gas plant as it now stands with its customers attached and what the bare plant would be worth without its customers attached." This is stated after saying: "Going value has been described as being the difference in value between two identical utilities, one of which is a going concern, having sufficient customers connected to its lines to consume its output, and an efficient working organization, while the other is not a going concern, has no customers to consume its output and has not an efficient working organization with years of experience behind it."[11]

Just what the commission has in mind baffles analysis. Overheads are not meant, for the same commission has dealt similarly with going value while allowing 15% for overheads.[12] The commission does not definitely refer to the cost of developing an organization, or establishing successful managerial policies, although these possibly may have been in mind. Logically, these items should not have been included, for they are proper operating expenses and customarily are allowed as such. In case revenues were not sufficient to cover all such operating expenses, plus a fair return, this fact would be reflected in early losses or deficits below a fair return. But this evidently was not the case, for the commission refused to make any allowance on such a basis. In view of the present control of accounting systems, losses or deficits below a fair return are the only evidence that operating costs such as advertising, attaching customers, developing new business, organizing the staff of the company, have not been compensated. And if these expenses

[8] *Re New York Telephone Company*, P. U. R. 1926, E 1, 53.

[9] See pp. 62, 64, 66.

[10] *Re New York Telepnone Company*, *supra* n. 9, at 50.

[11] *Re City of Sault Ste. Marie* (*Mich.*), P. U. R. 1921 E 321, 326.

[12] *Re City of Lapeer et al.* (*Mich.*), P. U. R. 1923 B 736, 739, 740.

have already been met out of charges paid by the customers, it is difficult to see the logic of a going value allowance of this kind in the rate base.

The only other possible interpretation of this and similar allowances is that the commission has in mind the difference between the original or reproduction cost of a property, and the amount the property would bring on the market in view of its established operations.[13] The fallacy and circular reasoning involved in such an allowance is as clear as it is in the case of good-will. Market value results from and is ordinarily measured by earnings and earning power. To use it as a factor in measuring the amount of a going value allowance, which is to be added to the rate base of a utility and thereby used as a basis for future earnings, is a fallacy sufficiently obvious to require no further elaboration.[14]

Another example of the fallacy of allowances of this nature is the following statement by a state commission, in which the uncertainty of meaning is striking: "That going value, that is, the difference in value between a going concern with an established business, and a plant completely assembled but without customers, is an element of value which must be taken into consideration in arriving at the fair value of the property of a utility for rate-making purposes, is no longer open to question. Such value must be fixed in a more or less arbitrary way, yet based upon all pertinent facts and circumstances in each particular case. In this case we are of opinion that an allowance of 10% for this element of value is not excessive."[15]

The actual items or amounts for which the commission wished to make allowance in this case are not apparent. Whether allowances should be made for items which are not even defined by the regulatory authorities seems at least open to question. As pointed out above, if this difference between the value of an established and going concern and the value of a plant completed but without a business attached represents the difference between actual cost, either original or reproductive, and market value, it clearly is not a logical element in a utility rate base. And if this is not the difference meant, what is it? Costs of developing a business are proper operating charges. If they have resulted in early losses or deficits below a fair return, that fact may well be introduced as evidence of going value. Otherwise, is it not fair to assume that such expenses have already been met from earnings?

The logic of this proposition is clearly brought out by the Indiana Commission in *Fort Wayne* v. *Home Telephone Co.*,[16] a case in which a separate allowance for going value was reluctantly made by the Commission:

"Going value, as the courts have held, is an element of value over and above the value of the structural elements, which inheres in a property which has an established business and is a going concern, and represents the difference in value between the dead structural property fully completed but not in operation, and the same property financed, organized, successfully operating

[13] That this may be the actual thought in the mind of the commission is perhaps indicated by its statement at the end of a similar discussion. "In the case of sale and purchase, there is no doubt as to which of these two utilities (one with customers and which is a going concern and one which is not so developed) would command the larger sale price, all other things being equal." *Re City of Lapeer, supra* n. 12, at 740.

[14] Contrast with *Minnesota Rate Cases*, 230 U. S. 352, 458, 459, 461 (1913).

[15] *Re Bluefield Water Works and Improvement Co.*, P. U. R. 1921 E 655, 663 (W. Va. Pub. Serv. Com.). This decision was later reversed by the U. S. Sup. Ct., 262 U. S. 679, but the going value allowance was not in controversy.

[16] P. U. R. 1920 D 83, 111.

with customers attached, and with revenues coming in. *The fundamental equity of an allowance of value on such basis is less certain, in the judgment of the commission, than is its legality.*

"There is no fundamental incompatibility between the two familiar theories of going value, viz. (1) 'dry bones and living body' and (2) 'cost of developing and attaching the business' . . . financing and organizing the business and developing and attaching the patronage are what make a living body out of the dry bones. The two theories are merely different aspects of the same thing and are to be measured in the same way. If any further meaning is to be attached to the former theory, it is on account of 'good-will,' which, it is generally agreed, is not an item on which a utility is entitled to a return. . . .

"In the opinion of this Commission, there is no warrant in equity for making an allowance for going value *where the cost of development included in operating expenses was not so great as to prevent the utility from earning a reasonable return on its investment* . . ." (*Italics ours.*)

Going value has sometimes been construed to include to some extent superior management, efficiency, and other managerial attributes.[17] It will suffice to point out that such corporate virtues may well look for their reward in the rate of return, but certainly their capitalization and inclusion in the rate base of a utility ignores completely the economic bases of public utility regulation and valuation for rate-making. Clearly this is a confusion of value in the market sense applicable in private businesses, with the "value" upon which a public business is constitutionally entitled to earn a fair return.

[17] Certain writers have advanced this point of view, for example: "Going value is too complex to be measured by any one element. It depends not only upon the excess of the return over legal interest on invested capital but also upon other elements, including the price at which the utility is able to render the service, the efficiency with which the utility functions and the nature of the relation which exists between it and the public which it serves. " . . . and going concern value, whether it consists in the power to earn a large income on the same unit price or to earn the same income on a lower unit price, results usually from sound business judgment and intelligent management, both of which are entitled to a proper reward." W. H. Maltbie, *Public Utility Valuation*, (New York: McGraw-Hill, 1924, pp. 87–88.)

Going Value as a Differential

In many cases going value, even though it may not be allowed as a separate and distinct amount, is nevertheless used as a differential between two varieties of "value." This differential may be either of two types: First, it may represent the difference between the market or sales value of a public utility and its appraised value as a successfully operating physical entity; Second, it may represent the difference between this same appraised value of the successfully operating physical entity and an amount which is the sum of the appraised values of the various distinct and separable items of physical property.

On first thought this classification of the meanings of going value may be considered redundant, for the meanings which have thus far been discussed might well be considered as differential amounts. The difference between the market or sales value of a utility and its appraised value as a successfully operating physical entity may in fact result from or represent good-will, or other intangible elements, such as those already pointed out, which ordinarily are reflected in market or sales value.

However, it has seemed best to group these various elements separately, while recognizing the apparent duplication of meanings which may result. The reason for this seeming duplication is the desirability of considering the various connotations of the term going value as nearly as possible as they are actually

presented in the cases. In that way the fallacies involved in the different uses of the term may be shown more effectively than could be done by grouping together *all* uses of going value which are in any way suggestive of the differential between market value and the appraised value of the utility as an operating physical entity.

a. *Differential between market or sales value and the appraised value of a successfully operating physical entity.* Many of the previous illustrations introduced conceptions of going value in which the market idea of value as applied to private businesses was undoubtedly involved. The confusion between market value, which ordinarily is the resultant of actual or potential earning power, and "value" as a basis upon which to compute the necessary fair return, has been almost universally condemned whenever it has been recognized.[18] As a result, most going value allowances, which *in fact* involve the market value fallacy, do so unconsciously and not deliberately.

That such clear applications of the market value concept do occur is well illustrated by the following statement of the New Jersey Supreme Court.[19] "We think that if by value we mean what the economists call exchange value, then a buyer would undoubtedly give more for a plant already doing a profitable business than for a plant of equal cost, capacity and future possibilities but without the established business. To a purchaser, the assurance of an immediate return is worth paying for." This statement is made after the Court had said: "The argument addressed to us on the other side is that all the so-called going value appears in the valuation of the physical plant at cost of reproduction; the suggestion is that unless there was going value, the physical value would be mere junk, and that the difference between the valuation of the physical plant at its cost of reproduction and its valuation as junk is the true going value. The argument seems to us specious rather than sound."

Here the introduction of the market value idea is quite plain. Many other statements regarding going value, a few of which have been presented in the preceding pages, would lead one to believe that similar principles of market or exchange value must have been in the minds of the commissioners or judges. Otherwise, it is difficult to find any explanation for the analyses of going value that frequently are presented.[20]

b. *Differential between the appraised value of the physical items of property and the total value of the property as a successfully operating entity.* This construction of the going value concept is more tangible and capable of analysis than those which have thus far been discussed, although much confusion has nevertheless become attached to it. Going value, as the differential between the sum of appraised values of the physical items of property and the total value of the successfully operating entity, does not involve any separate or distinct allowance for going value as a separate measurable item. In essence,

[18] For a leading judicial exposé of the fallacy of market value in public utility rate making, see *supra* n. 14.

[19] *Public Service Gas Case*, 84 N. J. L. 463, 477 (1913).

[20] See Smith and Dowling, *Cases on Public Utilities*, (St. Paul: West Publishing Co., 1926), note by R. L. Hale, p. 997, in which he makes similar conclusions after quoting from the decision of the Illinois Sup. Ct. in *City of Springfield v. Springfield Gas & Elec. Co.*, *supra* n. 7, at 222, where the court said of going value: "This element of value is always present in every assembled and established plant doing business and earning money. It is a property right and must be considered by the commission in determining the value of the property upon which the utility has a right to make a fair return. . . ."

it means simply that the physical property of a utility is evaluated or appraised on the basis of its being a successfully operating unit, rather than merely a collection of physical items, to each of which a dismantling or "separated" value might otherwise be attached.

The leading court decision supporting this interpretation of going value is *Des Moines Gas Co.* v. *City of Des Moines*,[21] a case which has often been misconstrued. The special master for the lower court in the Des Moines case had placed a valuation of $2,100,000 on the physical property, including an allowance of 15% for overheads. Originally he had added to this figure an additional amount of $300,000 for "going value," construed as the added value which results from a well-developed and paying business.

After preparing this valuation, the master was influenced by the decision of the Supreme Court in the Cedar Rapids case,[22] in which no separate allowance for going value was made. He therefore submitted merely his physical valuation of $2,100,000, saying:[23] "The physical value as hereinbefore determined is reckoned upon the fact that the plant was in 'successful operation' when the ordinance was enacted, otherwise its value would be much less. The 'going value' (which he excluded from his final valuation) is that enhancement which results from a well-developed paying business."

Upon appeal to the United States Supreme Court, going value was the principal point at issue. The Court declared that an element of going value undoubtedly exists in an established utility plant, but it upheld the master's report to the lower court in which he excluded any separate and additional allowance for going value, as we have seen. The Court said:[24] "That there is an element of value in an assembled and established plant doing business and earning money, over one not thus advanced, is self-evident. This element of value is a property right and should be considered in determining the value of the property upon which the owner has a right to make a fair return when the same is privately owned, although dedicated to a public use. Each case must be controlled by its own circumstances and the actual question here is: In view of the facts found and the method of valuation used by him, did the master sufficiently include this element in determining the value of this company for rate-making purposes?"

The Court then indicated that it was not applying the Wisconsin "deficits" idea in its analysis:[25] ". . . it is not to be presumed, without proof, that a company is under the necessity of making up losses and expenditures incidental to the experimental stage of its business."

Not content with this, the Court definitely stated how it was construing "going value:"[26] "When, as here, a long-established and successful plant of this character is valued for rate-making purposes, and the value of the property fixed as the master certifies upon the basis of a plant in successful operation, and *overhead charges have been allowed for the items and in the sums already stated*, it cannot be said, in view of the facts of the case, that the element of going value has not been given the consideration it deserves and the appellant's contention in this behalf is not sustained." (*Italics*

[21] 238 U. S. 165 (1915).
[22] *Cedar Rapids Gas Light Co. v. City of Cedar Rapids*, 223 U. S. 655 (1912).
[23] *Supra* n. 21, at 170, where the report of the master to the lower court is quoted.
[24] *Ibid.*, at 165.
[25] *Ibid.*, at 166.
[26] *Ibid.*, at 171.

ours.) Clearly, this means the Court considered that a sufficient sum had been allowed by the master, when he had appraised the items of physical property and had added thereto the overheads and organization intangibles, but excluded an additional and separate allowance of $300,000.

In line with this opinion, commissions have recognized going value as a factor influential in arriving at the final "fair value," without attempting to make a separate allowance for this item, or to define or explain just how much weight has been accorded in the final valuation. In this way, great latitude of administrative discretion is gained which otherwise would be lost to the courts through their exercise of judicial review. The Interstate Commerce Commission is following this interpretation of the going value question in its valuation of the railroads, despite the storm of protest that has been raised by the carriers.

In the Bangor and Aroostook case[27] the commission said in regard to the carrier's claim for going-concern value: "When we come to a consideration of final value we view and value the property as that of a common carrier fully organized and operating and with business attached. In the instant case the values assigned to the property are not those of a dead plant, but of a going concern. In making up the inventory we apply prices to the different parts of the property in the light of the fact that it is a railroad and doing business; otherwise the prices applied would be scrap prices. Our methods are similar to those adopted in the case of *Des Moines Gas Co.* v. *City of Des Moines.*" Again in the Elgin case[28] the Commission says: "We have not only valued these properties as a going concern, but in our estimate of the cost of reproduction new we have included organization expenses, the expenses of general officers and clerks, law expenses, expenses of stationery and printing, taxes and other general expenditures, and interest during construction. We have included working capital. We do not find that there are any other values or elements of value that pertain to the property of these carriers to which we can assign a money value."[29]

Similar interpretations of going value are found in decisions of the Federal courts. For example, the United States District Court for the Eastern District of Kentucky, in a case[30] in which *a separate going value allowance was conceded*, says in part: ". . . but such value . . . generally is the outgrowth of the expenses incident to assembling in one unit all the various parts which go to make up the whole. These expenses have received consideration in estimating overhead expenses during and prior to construction . . . In addition to this, general overhead charges of every conceivable kind have been included . . . It is extremely difficult to conceive of any other elements which might go into the property to increase its value as an entirety over the aggregate of component parts, and *we must not, in the name of going concern value, sanction the inclusion of mere goodwill as predicated upon earning capacity.*" (*Italics ours.*)

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[27] *Bangor & Aroostook Railroad Company et al.*, 97 I. C. C. 153, at 166–7 (1925).

[28] *Re Final Valuation of Elgin, Joliet & Eastern Ry. Co.*, 84 I. C. C. 587, 617 (1924).

[29] See also *San Pedro, Los Angeles & Salt Lake Ry. Co.*, 75 I. C. C. 463 (1923); *Texas Midland R. R.*, 75 I. C. C. 1 (1918). Nearly all the valuation decisions of the Interstate Commerce Commission, both tentative and final, contain similar statements.

[30] *United Fuel Gas Co. and Warfield Natural Gas Co. v. Railroad Commission of Kentucky et al.*, 13 F. (2d) 510, 521 (1925).

The above illustrations[31] are adequate to establish the nature and rather widespread existence of an interpretation of going value as a differential between the value of the physical parts of a property and its total value as an operating unit. This construction makes going value a non-separable element of rate base value, which is practically identical with allowances for the various classes of overhead expenses.

Going Value as Losses Necessarily Incurred or Income Foregone

The idea of treating going value as necessary losses and income foregone was first advanced by the Wisconsin Railroad Commission. It was formulated in what is known as the "Wisconsin Method" of treating going value.

The Wisconsin Method, as applied in the well-known case of *Hill* v. *Antigo Water Company*,[32] was based upon the theory that the costs of establishing a successful business, as evidenced by the income or fair return not received during the "developmental period" of the business, were essentially as much a part of the investment as the direct outlays incurred in the acquisition of land, buildings and other physical property. The reason for this attitude seems to have been the belief that businesses operating in a carefully regulated market could not offer sufficient inducement for an adequate flow of new capital at low cost unless they were allowed, within certain limits, the same privilege of making up pioneering losses which private business has. Although Wisconsin has followed the policy of capitalizing necessary early losses, it has recognized the possibility of amortizing rather than capitalizing such costs. Furthermore, the amount added to the rate base by this method has not been allowed to include losses due to careless and unprogressive management or to utility construction far in advance of the needs of the community.[33]

The attitude of the Wisconsin commission may be conveniently summarized from the Commission's headnotes to the Antigo case.

> Of the business alone of the plant the valuation that is most equitable for rate-making purposes appears to be best represented by the losses during the earlier years or by the deficits from operation during the development period . . . These losses or deficits had to be met by the owners and may be said to constitute the additional investment necessary to build up the business. These deficits therefore represent the cost of the business in very much the same way as that in which the cost of construction represents the cost of the physical plant. In fact, the one appears to be as legitimate and necessary a part of the cost of the enterprise as a whole as the other, or of that cost upon which a reasonable amount of interest and profits should be earned. This appears to hold good at least until the deficits or the investments occasioned by them have been made good and restored to the investors, either through surplus profits or in some other form . . . In the long run such treatment or its equivalent to the investors is . . . necessary in undertakings of this character in order to obtain the capital that is required.

The cost of building up the business may also be dealt with in another way with substantially the same results to the investors. Instead of being charged to the capital account it may be gradually written off by being charged directly to the consumer and then returned to the investors . . . When treated in this manner the cost of building up the business becomes only a temporary charge against the consumers, but is shifted from all the consumers of a

[31] See also *Re Helena Light & R. Co.*, P. U. R. 1920 D 668, *Cincinnati & Suburban Telephone Co. v. P. U. C. of Ohio*, 113 O. S. 259, 295 (1925), for similar analyses.

[32] 3 W. R. C. R. 623 (1909).

[33] *Oconto City Water Supply Co.*, 7 W. R. C. R. 497 (1911); *State Jour. Printing Co. v. Madison Gas and Elec. Co.*, 4 W. R. C. R. 501, 585, 586 (1910); *City of Beloit v. Beloit W., G. and El. Co.*, 7 W. R. C. R. 187, 277 (1911).

plant to only a part of them. In other words, a part of the total cost of securing the plant and its business is extinguished or wiped out at the expense of those who may be consumers during the amortization period, and for the benefit of all future consumers. Since such plants are built for future as well as for present consumers, the question naturally arises whether this method is just and equitable as between consumers. . . . If the cost of the business alone is legitimate and necessary, then it would also seem to follow that this cost should be borne by all the consumers rather than by a part of them . . . The best way of distributing this cost over all the consumers is to charge it to the amount upon which the returns should be reasonable.

Likewise, the Wisconsin Method appears to have included a determination of the extent to which the early deficits of the developmental period of the business were recouped by the utility in subsequent earnings. As described in *City of Green Bay* v. *Green Bay Water Co.*,[34] "the method which has been followed by the commission aims to determine as far as possible what the actual cost of developing the business in question has been, and to what extent, if at all, such losses have been recovered in later years of operation."[35]

The "deficits method" has frequently been limited to only the necessary deficits below a fair return on the investment of the *present* owners. This point of view is expressed in a decision of the New York Supreme Court:[36] "In determining whether the plaintiff is to be entitled to a 'going value,' it must be borne in mind that in 1901 it took over an established and going concern and did not start the water business, but continued, extended, and expanded an already established enterprise; and in the absence of proof to the contrary, it must be assumed that its income was sufficient to pay a fair return upon its actual investment, and the burden of proving otherwise rests upon the plaintiff . . ."

As originally developed, the Wisconsin deficits theory was employed with the investment standard of valuation. By other regulatory authorities it has been applied in conjunction with other standards of valuation, as we shall see subsequently.

The Wisconsin Method since its inception has had widespread influence upon the decisions of both courts and commissions. In recent years it has indeed been more actively used in other jurisdictions than in that of its origin. It also has been criticized from a number of standpoints. For example, the charge has been made that the Wisconsin Method guarantees a fair return to a utility; that extravagant and poor management are encouraged by the deficits principle; that a consistent application of the method results in the "ridiculous circumstance" of a bankrupt utility possessing a larger "value" than a successful and profitable concern.

A more substantial criticism is offered by those who argue that losses or deficits, even granting their necessity, do not represent investments and should not be included in the rate base. Proponents of this view ordinarily admit, however, that necessary deficits or losses should

[34] 11 W. R. C. R. 236 (1913).

[35] See also: In *Re Rates and Rural Service of Monroe County Tel. Co.*, 18 W. R. C. R. 890 (1917). For an important decision upholding the Wisconsin Method, see *Kings County Lighting Co. v. Wilcox*, 210 N. Y. 479 (1914).

[36] *N. Y. Interurban Water Co. v. Mt. Vernon*, P. U. R. 1920 D 515, 521. A similar idea is intimated in *Galveston El. Co. v. City of Galveston*, 258 U. S. 388 (1922), in which the Court remarks in a note, at p. 395, "if what is to be considered in determining the net deficit is not the result of operations from the beginning of the enterprise, but the result of operations since the present owner acquired, in other words, the return on its investment, we are left without the data necessary to determine the fact." See also *State Jour. Printing Co. v. Madison Gas and El. Co.*, and *City of Beloit v. Beloit W., G. and El. Co.*, *supra* n. 33.

be compensated, but urge that the compensation should be made by allowing a rate of return sufficiently liberal to amortize any proper amounts of this character, or "sufficiently high to attract them (the investors) into the field under the particular conditions involved, among which is the possibility of little or no return during the first few years."[37]

Some courts and commissions have adopted this view of the question. Best known have been the decisions of the former New York First District Commission, in which it applied a policy of amortizing such losses or deficits rather than adding them to the rate base.[38]

> In so far as these elements of going concern value are transitory and call for expenditures year after year, it is obvious that they should not be paid out of capital, but should be charged as a part of operating expenses . . . But it ordinarily happens during the first few years of operation that the company does not earn a fair return. How, then, are the investors to be made whole?
>
> There are two solutions. One is to capitalize the losses or deficiencies below a fair return and all the other elements which are said to be included in "going concern" . . . To follow this solution of the problem would open the door wide to overcapitalization, financial manipulation, and the misappropriation of funds. The other solution is to charge all such expenses to operation, to attempt to make no fine-spun distinctions and then permit the company to charge in later years rates sufficient to offset its deficiencies below a fair return in the first few years . . . Then the rates of return to be allowed upon the investment should be such as to offset losses in early years. This principle is adopted in this case, and no further allowance is made for "going concern" in determining the fair value of the property.

In summary, it appears that of the various uses of the term "going value"—as good-will; as merely an intangible attribute of a utility organized, with business and customers attached, and in profitable operation; as a differential between the original or reproduction cost of a successfully operating utility and its market or exchange value; as a differential between the original or reproduction cost of a successfully operating entity and the value of its separate physical parts; or as an amount representing the necessary deficits below a fair return—only the last two have logical significance. And of these two, that which construes going value as being simply the difference between the appraised value of the separable units of property and total fair value computed on the basis of original or reproduction cost presents no problem. In reality, it amounts to little more than saying that all necessary overheads should be added to the appraised value of the various physical items constituting a utility plant, and that the properties should be valued as a successfully operating unit, rather than as merely a collection of physical units to which a dismantling or "junk" value might be attached. This use of the term is best illustrated by the Des Moines case and by the valuation decisions of the Interstate Commerce Commission.[39]

Concerning the validity of this construction of going value there can be no dispute. Unfortunately, however, the concept of going value is confused by the obscure language used in discussing it. Undoubtedly, the lack of clarity or frankness sometimes found in the decisions of the Interstate Commerce Commission and other bodies may be traced, in part at least, to the uncertain position of the courts on this point, and the desire of the commissions to build a useful camouflage against the frequently de-

[37] See B. W. Lewis, "Going Value—Comments on its Nature and Legal Status," *American Econ. Review*, December, 1927.

[38] *Queens Borough Gas & El. Co.*, 2 P. S. C. 1st D., N. Y., 544, 568-569 (1911)

[39] See pp. 65, 66.

structive and discouraging results of judicial review.

Going value in the sense of necessary losses and deficits below a fair return, therefore, remains the one use of the term which is constructive in nature. Going value as ascertained by the Wisconsin Method, or by variations of this method, constitutes a definite and significant addition to the theory of rate-making valuations, *provided only that* its fundamental premises are accepted as valid.

It is believed that the economic significance of this type of going value has been much obscured by the failure to discuss the problem with reference to the several theories or standards of of valuation. Although the so-called net deficits theory originated in close association with the investment standard of valuation, its use outside of Wisconsin often in connection with other standards of valuation has resulted in a serious confusion of premises, and in many illogical applications.[40] Consequently, the validity of the Wisconsin method may be considered profitably from the standpoint of the investment basis of valuation, the cost of reproducing the existing plant, the cost of reproducing the service, and finally, from the historical or actual cost basis of valuation. That method of analysis will be followed in the second section of this discussion.

[40] In addition, the economic validity of the entire going value concept has been challenged by recent writers. (See particularly H. B. Vanderblue, "Railorad Valuation" (Boston: Houghton Mifflin Co., 1917), pp. 166–177; B. W. Lewis, "Going Value—Comments on Its Nature and Legal Status," *op. cit.*) The principal points of criticism relate to the practical difficulties inherent in the application of going value in this sense, and to the alleged economic fallacy of considering the necessary deficits below a fair return as a portion of the investment or sacrifice upon which a utility should be allowed to earn a fair return. Certain of these criticisms will be considered in the following section of this discussion.

THE ASSESSMENT OF REAL ESTATE IN CHICAGO, 1927

By GRACE MERTSKY [1]

DURING the past two years, the Institute for Research in Land Economics and Public Utilities has been making an intensive study of real estate assessments in Chicago, under the direction of Dr. Herbert D. Simpson of the Institute Staff. More than 6,500 real estate transfers have been analyzed, and the sales values established in these actual sales have been compared with the assessed valuations, as made by the Board of Assessors and Board of Review.

Previous reports[2] have analyzed the assessments of 1923 to 1926, inclusive. In cooperation with the Joint Commission on Real Estate Valuation, appointed by the Board of Commissioners of Cook County in the autumn of 1926, these studies have been carried through 1927, and the results are summarized below. These results, it should be noted, apply to the quadrennial assessment of 1927, as made by the Board of Assessors, before revision by the Board of Review. At the time of writing, the final valuations by the Board of Review for 1927 have not been completed.

In Table I the average level of assessment is shown for each year since 1923. In this and the following tabulations, assessed value means the figure placed by the Board of Assessors or Board of Review as representing the *full value* of the property.[3]

TABLE I. RECORD OF ASSESSMENT THROUGHOUT FIVE YEARS, CHICAGO, 1923–1927

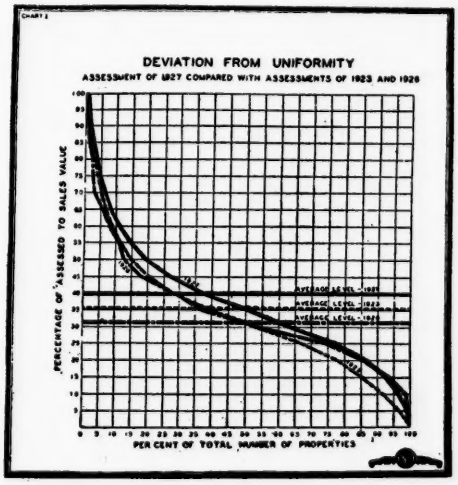
	Average Percentage of Assessed to Sales Value of All Properties Studied
Initial Quadrennial Assessment of 1923	35.4
Assessment of 1923 after Revision by Board of Review	34.5
Assessment of 1924 after Revision by Board of Review	31.9
Assessment of 1925 after Revision by Board of Review	31.2
Assessment of 1926 after Revision by Board of Review	31.3
Initial Quadrennial Assessment of 1927	39.8

It will be observed that in the four-year period from 1923 to 1926, inclusive, in the process of revision by the Assessors and the Board of Review, the average assessment dropped from 35% to 31% of actual value. This was in a period of advancing real estate values. If the

[1] Henry Strong Scholar in Urban Land Economics at Northwestern University, 1927–1928.

[2] *The Journal of Land and Public Utility Economics*, August, 1927, pp. 329ff; Herbert D. Simpson, *The Assessment of Real Estate for Taxation in Chicago* (pamphlet), July 1927; *A Study of Assessment Methods and Results in Cook County*, prepared by the Joint Commission on Real Estate Valuation for the Board of County Commissioners of Cook County, July 1927.

[3] Prior to 1927, 50% of this value was adopted for purposes of taxation.


DEVIATION FROM UNIFORMITY
ASSESSMENT OF 1927 COMPARED WITH ASSESSMENTS OF 1923 AND 1926
PERCENTAGE OF ASSESSED TO SALES VALUE
PER CENT OF TOTAL NUMBER OF PROPERTIES

annual appreciation could have been registered in the figures, the declining ratio of assessment to sales value would have been still more pronounced. The figure for 1927 represents an abrupt increase of 27% in the average case of assessment.

Both movements, the decline from 1923 to 1926 and the abrupt increase in 1927, illustrate the natural tendency of a quadrennial system of assessment. The initial assessment wears away year by year throughout the period and has to be abruptly restored at the end of it, together with any additional increase made necessary by the expansion of governmental needs in the interim.

In Table II is shown the distribution of rates of assessment for 1927. It will be noted that the inequalities are fully as great as those in previous years, with assessments ranging all the way from 1% to over 100% of actual value. There is some apparent concentration in the range from 26% to 45%, but this is a wide range; when converted into terms of 100%, it is equivalent to a range of 57 to 100. In terms of property value, any apparent concentration extends

TABLE II. DISTRIBUTION OF ASSESSMENTS ACCORDING TO PERCENTAGE OF ASSESSED TO SALES VALUE IN CHICAGO

(Initial Quadrennial Assessment, 1927)

Percentage of Assessed to Sales Value	Number of Properties Assessed at Indicated Percentages	Percentage of Total Number of Properties	Value of Properties Represented
1 to 5.....	56	.93	$ 1,917,600
6 to 10.....	149	2.47	4,264,700
11 to 15.....	251	4.16	11,775,500
16 to 20.....	387	6.41	12,944,800
21 to 25.....	563	9.33	22,289,100
26 to 30.....	817	13.54	24,598,400
31 to 35.....	787	13.04	25,196,300
36 to 40.....	759	12.58	23,862,800
41 to 45.....	635	10.52	21,628,300
46 to 50.....	440	7.29	19,698,800
51 to 55.....	308	5.11	9,566,800
56 to 60.....	200	3.32	6,605,800
61 to 65.....	180	2.98	9,428,900
66 to 70.....	105	1.74	3,720,800
71 to 75.....	101	1.66	3,041,200
76 to 80.....	74	1.22	3,938,400
81 to 85.....	61	1.01	2,850,200
86 to 90.....	52	.86	1,539,500
91 to 95.....	32	.53	1,852,500
96 to 100.....	26	.43	1,613,500
101 and over.....	52	.87	2,655,100
Totals.....	6,035	100.00	$214,989,000

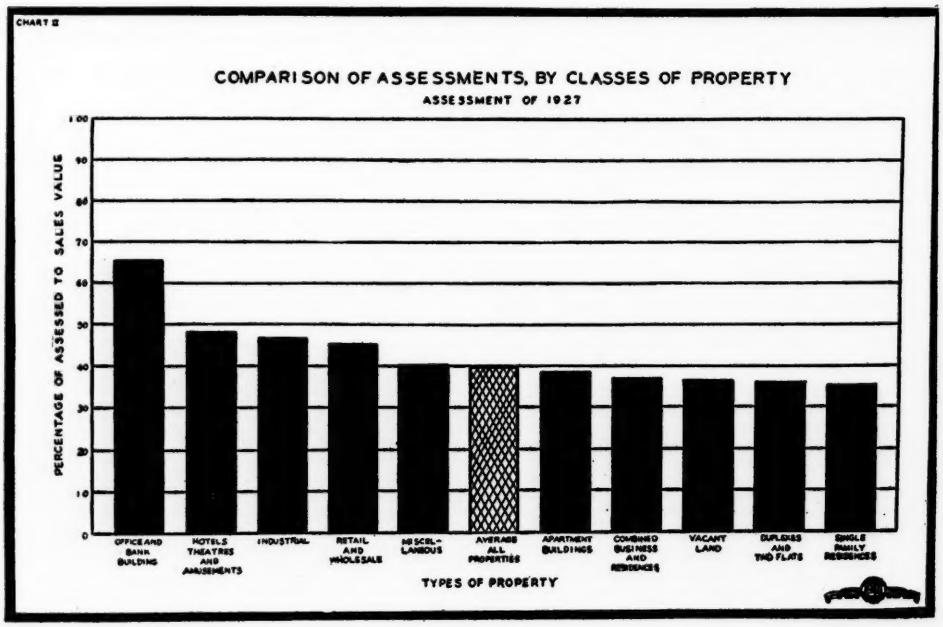


TABLE III. INITIAL QUADRENNIAL ASSESSMENTS IN CHICAGO BY CLASSES OF PROPERTY, 1927

Classes of Property Arranged in Order of Percentage of Assessed to Sales Value	Number of Properties	Value of Property Represented	Average Percentage of Assessed to Sales Value	
			1927	1926
Office and Bank Buildings	23	$ 4,046,700	65.46	53.4
Hotels, Theaters, and Amusements	31	8,226,300	48.32	31.2
Industrial	129	13,870,800	46.71	38.1
Retail and Wholesale	453	21,146,600	45.45	36.3
Miscellaneous and Unclassified	256	9,675,700	40.26	30.9
Apartment Buildings	1,588	80,381,900	38.71	32.3
Combined Business and Residence	565	21,700,100	36.82	29.5
Vacant Land	842	21,008,400	36.16	19.7
Duplex or Two-Flats	850	13,690,900	35.74	29.4
Single-Family Residences	1,298	21,241,600	34.96	27.7
All Properties	6,035	$214,989,000	39.83	31.3

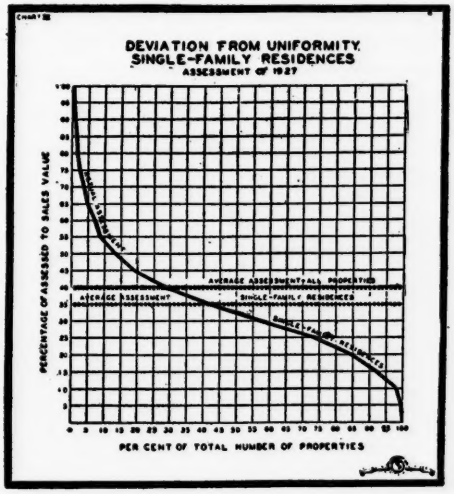
from 21% to 50%, which is equivalent to a range of from 42 to 100.

The results are visualized in Chart I, in which the assessments of 1923, 1926, and 1927 are compared. In this chart, the horizontal dimension represents the total number of properties, the vertical dimension the percentage of assessed to sales value. The curves represent the relative assessments of 6,035 properties, arranged in descending order. The three horizontal lines represent the average level of assessment for each year. Uniform assessment of all properties at these levels for each year would have resulted in the same aggregate assessment and the same revenue yield as those obtained by the actual assessment, with its wide range of discrimination. Measured mathematically, the curve for 1923 has an average deviation from uniformity of approximately 40%; that for 1926 a deviation of 37%; that for 1927, 36%.

In Table III the properties have been classified, and the average rate of assessment shown for each group, for both 1926 and 1927. It will be noted that

TABLE IV. ASSESSMENT OF SINGLE-FAMILY RESIDENCES, CHICAGO, 1927

Percentage of Assessed to Sales Value	Number of Properties	Percentage of Total Number	Value of Property Represented
1 to 5	5	.38	$ 124,700
6 to 10	21	1.62	557,200
11 to 15	80	6.16	1,691,700
16 to 20	96	7.40	1,579,900
21 to 25	145	11.17	2,328,600
26 to 30	210	16.18	2,904,600
31 to 35	200	15.41	2,987,100
36 to 40	174	13.41	2,637,900
41 to 45	123	9.48	2,193,100
46 to 50	73	5.62	1,093,100
51 to 55	57	4.39	1,028,600
56 to 60	24	1.85	443,100
61 to 65	27	2.08	384,400
66 to 70	13	1.00	208,000
71 to 75	17	1.31	238,700
76 to 80	10	.77	350,400
81 to 85	6	.46	81,000
86 to 90	6	.46	98,500
91 to 95	2	.16	23,000
96 to 100	4	.31	164,500
101 and over	5	.38	123,500
Total	1,298	100.00	$21,241,600


DEVIATION FROM UNIFORMITY
SINGLE-FAMILY RESIDENCES
ASSESSMENT OF 1927
PERCENTAGE OF ASSESSED TO SALES VALUE
PER CENT OF TOTAL NUMBER OF PROPERTIES

single-family residences, which stood next to the lowest in 1926, are now receiving the lowest rates of assessment; and that the assessment of vacant land has very nearly doubled.

The results are visualized in Chart II.

If the low average rate of assessment on private homes were conferred on all home-owners equally, some grounds of justification might be found for it. That such is not the case is shown in Table IV and the wide range of discrimination in the assessment of home-owners is clearly illustrated in Chart III.

A full report, covering the results of the entire study and including an analysis of Chicago assessments from 1923 to 1927, inclusive, will be issued some time within the next two months.

THE STATUS OF LAND AND CAPITAL IN THE ELEPHANT BUTTE IRRIGATION DISTRICT

By ARTHUR L. WALKER AND ALBERT S. CURRY

IRRIGATION probably has been practiced in the arid regions of the southwest to a limited extent since prehistoric times. When the Spanish explorers from the south entered the territory now known as New Mexico and Arizona, they found the remains of ancient aqueducts and also found the natives irrigating crops of various kinds by means of water diverted from the rivers and small streams.[1] "The earliest authentic record we have as to the practice of irrigation, comes from the memoirs or reports of Cabeza de Vaca in 1536, Coronado in 1541, and, 41 years afterwards, in 1582, Antonio de Espejo; wherein mention is frequently made of the Pueblo Indian tribes in the Rio Grande Valley who cultivated the soil and secured abundant yields of wheat, corn, melons, etc., by means of ditches, diverting the water from the river upon the fertile Rio Grande soil."[2]

The natives who inhabited the Valley between the time of the coming of the Spanish explorers and the present have continued to use practically the same methods of irrigation and construction that were used by the Indians. These ditches were constructed by means of the water level principle after an estimate of the fall had been made. This accounts for the fact that the ditches are extremely crooked and have few, if any, cuts and fills. The Rio Grande Valley of New Mexico is known as the American Nile, because of its rich and fertile soil and upon this river the Elephant Butte Project is located.

In 1892, when the citizens of El Paso realized the need for a means of controlling the annual flood menace and at the same time providing for the economic use of flood waters of the Rio Grande River for irrigation purposes, they formed a company to build an international dam near that city. After a careful examination of conditions, engineers found that the cost of such an undertaking would be practically prohibitive because of the expense of construction and the necessity of reimbursing home owners in the valley above the proposed dam whose lands would be submerged. In 1893 the same group of individuals combined with citizens of Las Cruces, a New Mexico town 40 miles distant, in an organization which was known as the Rio Grande Dam and Irrigation Company. Their plan was to construct a storage dam near Elephant Butte and build diversion works and canals along the river. The large expenditure of funds which would be required for the completion of the project, in the face of the adverse economic conditions prevalent at the time, made it necessary for this company to abandon the plan.

Later, Dr. Nathan Boyd, a Virginian, saw the possibilities of the project and decided to give it his support. He went to Europe in 1894 and formed a company to furnish funds for the enterprise. The engineer employed by this company made a survey of conditions, submitted a favorable report, and work was begun on the canals and diversion dams. Several areas of land were blocked out

[1] R. P. Teele, *Irrigation in the United States*, (New York. D. Appleton & Co., 1915) p. 9.

[2] C. D. Miller, *The Irrigation Resources of New Mexico*, p. 3-4 (1911).

and contracted for sale. A splendid start toward a complete irrigation system had been made when operations of the company were stopped in 1897 by the International Boundary Commission because of complications with Mexcio and parties interested in the river for purposes other than irrigation. This action resulted in many years of litigation, which involved several small fortunes and was only checked when the people of the valley asked for the present reclamation project. This action was taken soon after the Reclamation Law was passed.[3]

Legislative Activities

An act appropriating the receipts from the sale and disposal of public lands in certain states and territories to the construction of irrigation works for the reclamation of arid lands was passed by both Houses of Congress and approved by the President of the United States, June 17, 1902. Some of the outstanding features of this Act were as follows: (a) A "reclamation fund" was created whereby the moneys received from public land sales could be used in examinations and surveys for the construction and maintenance of irrigation works and for the storage, diversion, and development of waters needed to reclaim arid and semiarid lands in these states and territories; (b) The Secretary of the Interior was authorized to make examinations and surveys and to locate and construct irrigation works; to withdraw from public entry the lands required for any irrigation works contemplated under the provisions of the Act; and, when it was found that any irrigation project was practicable, to contract for the construction of the same in such portions or sections as might be practicable to construct and complete as parts of the whole project, provided the necessary funds for such portions or sections were available in the reclamation fund; (c) When in carrying out the provisions of this Act it became necessary to acquire any rights or property, the Secretary of the Interior was authorized to acquire the same for the United States by purchase or by condemnation under judicial process.[4] A plan for beginning work under the Reclamation Law was submitted to the Secretary of the Interior by the Director of the Geological Survey and was approved on July 8, 1902, authorizing the creation of the "Reclamation Service."

Even before this date attention was directed to the Rio Grande Valley. "The Reclamation Service of the United States Geological Survey began investigations on the Rio Grande on March 1, 1902,"[5] realizing that the construction of a storage dam would give a more dependable irrigation system than existed at that time in the Mesilla and El Paso Valleys.

Engineers of the Reclamation Service carefully studied conditions in the Mesilla and El Paso Valleys and considered the possibilities of dams at both El Paso, Texas, and Engle, New Mexico. "The survey of the Engle reservoir site and the dam site was completed in August, 1903,"[6] at which time the director of the Reclamation Service reported in part as follows: "So far as known, the only site for such a dam and reservoir on the river is the site selected by the reclama-

[3] G. B. Anderson, "The Conquest of the Desert," *25 Out West*, pp. 109–123. (August, 1906.)

[4] For full text of the Reclamation Act, see 32 U.S. Statutes at Large, Pt. I, ch. 1093, p. 388 (57th Congress, 1901–3).

[5] *2nd Annual Report*, United States Reclamation Service, p. 377 (1902–1903).

[6] *Ibid.*, p. 95 (1902–1903).

tion engineers below Elephant Butte, near Engle, New Mexico."[7]

The text of the report of the director of the Reclamation Service indicated clearly that a logical location for the dam and reservoir had been definitely decided upon, but before the approval of the project could be obtained and construction begun the claims of Mexico had to be considered, which were "certain prior rights to the use of the water of the Rio Grande and also certain treaty rights as regards navigation."[8]

Accordingly a treaty was entered into with the Republic of Mexico on May 21, 1906, in which the United States agreed to furnish in the river bed at the head of the old Mexican Canal near El Paso 60,000 acre-feet of water per annum to be used in Mexico. This was approximately the amount that had been used for about 300 years in the old Mexican Canal prior to 1880, since which time irrigation by American citizens on the headwaters in Colorado has caused a deficiency in the low water flow of the river at the head of the canal. In return, the Mexican government waived all other claims to water in the Rio Grande above the town of Fort Quitman, Texas, and all claims for past damages from shortages of water. To make the project still more feasible, Congress by an act of June 12, 1906 extended the provisions of the Reclamation Act to the state of Texas.[9]

The signing of the treaty with Mexico removed the greatest obstacle to the construction of the dam, and considerable progress was made in the development of the project. Additional impetus was given by a convention between the United States and Mexico, proclaimed January 16, 1907, which made $1,000,000 available as needed, to be expended under the direction of the Secretary of the Interior in connection with the irrigation project on the Rio Grande.[10]

Before the provisions of the Reclamation Act could be utilized, a Water Users' Association in New Mexico and one in Texas had to be formed, including in this membership all the farmers on the proposed project. Some of these farmers had rights of priority and others had water rights given them through Spanish land grants. However, it was necessary for them to release these rights and join one of the associations so that a greater acreage of farm land could be put into cultivation. The construction of the dam was to insure the farmers a constant and sufficient supply of water and protect them from periodical floods which in the past had damaged agricultural operations to the extent of several thousands of dollars annually.

Nevertheless, actual construction on the Elephant Butte Dam was not begun until 1911, nine years after the Reclamation Act was passed. The reservoir created by this structure enables the irrigation of the Mesilla and El Paso Valleys. This dam is one of the largest irrigation structures in the United States. A large amount of money, time, and energy was required for surveys, organization, and the completion of other details which extended over a period of seven or eight years previous to the beginning of construction work on the dam itself, which alone required about five years for completion. In addition to this it was necessary to construct diversion works, remodel some of the old

[7] *3rd Annual Report*, United States Reclamation Service, p. 420 (1903–1904).

[8] *2nd Annual Report*, United States Reclamation Service, p. 62 (1902–1903).

[9] *5th Annual Report*, United States Reclamation Service, pp. 220–221 (1906).

[10] *6th Annual Report*, United States Reclamation Service, p. 155 (1906–1907).

community ditches or acequias, and in places construct new ones, as well as to install a large number of headworks and turnout boxes, in order to complete the distribution system. After the irrigation system was placed in operation many of the lands became water-logged and arrangements for drainage facilities became necessary.

Construction Works

The main dam was finished in 1916 at a cost of about $5,000,000. Its reservoir affords flood protection and supplies sufficient water for the farmers living below the dam for a distance of 100 miles or more. "The maximum height of this dam from deepest excavation to the top of the parapet wall is 306 feet. It has a width at the base of 215 feet and contains approximately 600,000 cubic yards of concrete masonry."[11]

The reservoir as completed has a capacity of over 2,600,000 acre-feet of water. At the time this project was inaugurated it was the largest irrigation project in America. Upon completion, which is assured in the near future, the project will include approximately 386 miles of drains and about 632 miles of canals and laterals, all of which must be maintained and operated.

The Leasburg Diversion Dam, located at the upper end of the Mesilla Valley, was completed in 1908 at a cost of $97,000. This dam is a reinforced concrete weir, resting on piles. The Mesilla Diversion Dam, which is 20 miles below the Leasburg Diversion Dam, was constructed in 1916 at a cost of $126,000.[12] The function of these two and similar dams placed at intervals in the river channel is to divert the water from the river to the adjoining farming communities. Eventually about 155,000 acres of land in New Mexico and Texas will be reclaimed as a result of the institution of this project.

The average elevation of the Mesilla and El Paso Valleys is 3700 feet above sea level and the temperature ranges from eight degrees below to 105 degrees (Fahrenheit) above zero. Annual precipitation is about 10 inches, with only a trace of snow. The soil is rich alluvium and sandy loam, being formed largely by river overflow, and when irrigated, produces crops of cotton, alfalfa, corn, wheat, melons, fruits and vegetables.[13]

Land Settlement and Farm Development[14]

Only a small percentage of the total acreage in the Mesilla and El Paso Valleys was in cultivation at the time of the inauguration of the Rio Grande Federal Irrigation Project. The water supply was limited and very uncertain as the river flow varied from practically nothing during drought periods to floods during the rainy season and, hence, only a minimum acreage could be operated. In 1915, just before the storage works were completed, 33,876 acres were under irrigation and 142,523 acres were irrigated in 1926. An average of approximately 10,000 acres was put under irrigation annually, the greatest development being evident from 1922 to 1926. During the years of 1917, 1918, 1919, and 1920 the increase in irrigated acreage was small, partly because of the war situation and also because seepage conditions were at a maximum.

[11] Dean W. Bloodgood, "Drainage in the Mesilla Valley of New Mexico," *New Mexico Experiment Station Bulletin 129*, p. 6 (1921).

[12] *Ibid.*, p. 8.

[13] "Irrigation Projects," Department of the Interior, p. 20 (1920).

[14] Data relative to subjects treated under "Land Settlement and Farm Development" were supplied through the courtesy of the United States Reclamation Service, with offices at El Paso, Texas.

A similar development is seen when we consider the number and size of farms and the proportion of each farm operated. In 1915 there were 1,096 farms, averaging 37 acres each, although only 31 acres per farm were irrigated. The remaining 6 acres on each farm were uncultivated lands or were used for yards and corrals. In 1926 there were 4,562 farms, averaging 33 acres each, but the same number of acres (31) were irrigated. This shows a substantial decrease in the amount of uncropped land. The increase in number of farms has been continuous since 1915, but the number of acres per farm varied until about 1920. The entire acreage of the farms, however, was not cropped and, in fact, even the entire irrigated area on each farm was not producing crops. As an average during the period from 1921 to 1926, inclusive, each farm contained 32 acres, only 25.4 of which were cropped. The other 6.6 acres per farm yielded no returns. Close observation indicates that about 2 acres on the average farm are used in the farmstead. The remaining 4.6 acres, or approximately 14% of the acreage per farm, yield no returns, which displays the need for a more efficient farm layout.

Practically the same primitive methods of irrigation used by the Indians continued in use until a short time after the construction of the dam. During the past few years, however, there has been considerable improvement in irrigation methods. Prominent features of the old system were the partial leveling of land, and putting up of borders or dikes to make basins which were about 40 feet square. As these basins were filled with water, a portion of the land was covered to a depth of a foot or more, while a part was only barely covered. On those areas where water was applied to the greater depth, the crops were damaged, while the crops on the areas that were barely covered suffered in a short time from lack of moisture, which resulted in low yields of crops of uneven quality that did not command a top price on the market. This method has gradually disappeared with the influx of new farmers and at the present time a large amount of the poorly prepared land is being releveled. A change in the type of farming, made necessary to meet financial obligations, and the use of methods approved by experience have been factors in bringing about this betterment. Doubtless thousands of dollars were lost and many farmers were disappointed with the poor results of their efforts, attributable to the lack of supervision in clearing and preparing their land.

Dr. Elwood Mead pertinently comments on this question by saying that "building canals is . . . only the initial stage in reclamation. Preparing the land for cultivation, securing settlers and teaching them the technique of irrigated farming are all necessary. There is the same need for organization and constructive planning and expert direction in the succeeding stages as in the first . . . At the outset there was the mistaken but confident belief that building canals would alone create agriculture; that once water was available settlers would rush in and without aid or direction complete the difficult and costly work of clearing and leveling the land and do the many other things needed to change deserts into farms."[15]

Chambers of commerce and various other organizations have taken an active part in inducing settlers to come to this project. They have broadcasted information concerning farming and social and economic opportunities by means of local papers, booklets, letters

[15] "Federal Reclamation—What It Should Include," Department of the Interior, p. 3 (1926).

and personal contact. Advertising media of this type have had a great deal of influence in inducing farmers to settle here. It has been impossible for these organizations to keep accurate records of the results obtained. However, one chamber of commerce estimates that from November, 1923 to June, 1927, by the use of 20,327 booklets sent out in reply to a like number of inquiries received, it induced approximately 500 settlers to establish residence on the project. Another organization estimates that through its activities, 450 settlers have been influenced to make their homes here. It is needless to point out that probably 90% of these people were attracted by the wonderful climate or other natural advantages and knew nothing about irrigation farming.

The fact that the settlers induced to come by this form of advertising represent only a small percentage of the total has alleviated many of the difficulties which other reclamation projects have suffered as a result of not selecting settlers. The Rio Grande, like most other "Federal projects, had no settlement restrictions and neither plan nor money to organize and advise the unschooled to overcome the obstacles which confronted them," says Dr. Mead[16] who adds: "Public opinion was generally averse to such measures or to any restrictions on settlement. Few settlers had money enough to carry on their farming operations. The distress caused by shortage of funds was intensified by absence of any crop program or marketing plan." The fact that the Valley of the Rio Grande was in large measure settled at the time the Rio Grande project was installed under Federal auspices in part accounts for the success of the project, for practically all those in the valley before the Elephant Butte Dam was constructed had a thorough knowledge of the problems encountered in irrigation farming.

A positive statement concerning the tenancy situation on the project is hazardous because only a few minor studies have been made and these indicate that tenancy has not yet reached a constant stage. The studies show that 27% of all farms are at present operated by tenants, which is not considered an unhealthy condition. The fact that cotton production has been an important farm enterprise during the past few years has been of considerable influence in increasing the percentage of tenants. Some owners make a practice of leasing undeveloped land for a year or more to tenants who are willing to perform, as rent, the services of clearing and leveling. Tenants have received fair returns from this practice, since cotton grows moderately well on newly prepared land and on the average has sold for good prices during the past few years. The percentage of tenant-operated farms decreased from 1925 to 1926, which is partly explained by the fact that many tenants became owners during the period because of the relatively high prices received for cotton from 1920 to 1925.

Production Problems

The increase in the total cropped acreage in the project resulted in more water being used, which in time filled the ground and finally came to the surface. Evaporation caused alkali to be deposited upon the soil surface and created the need for an efficient drainage system. In 1918 there were about 100,000 acres of seeped land on the project which was more than 50% of the ultimate total number of acres to be brought under cultivation. The remedial mea-

[16] *Ibid.*, p. 5.

sure adopted for the elimination of the surface water was the construction of open drains. This work has been completed and as a result only a small percentage of the total acreage is now seeped. Thus far the drains have served satisfactorily for eliminating the seepage water, but as it receded some alkali remained upon the surface in many places. Leaching has been practiced to carry away these harmful salts but before this can be efficiently done the land must be thoroughly leveled and bordered with dikes to hold the water over the area being washed. This is an expensive process, requiring an expenditure of about $35 per acre, which amount includes the costs for labor and water.

Gophers have been a serious pest to the farmers and project operators. They burrow through the ditch and canal banks, causing thousands of dollars loss annually by wasting water, flooding crops and necessitating large expenditures for repairs. Various methods of controlling these pests have been tried but those in most common use are trapping and poisoning. Some farmers have obtained good results by paying bounties of five or ten cents per gopher to boy trappers in the community.

Summer floods are another serious menace to a number of farmers, as well as to the Reclamation Service. They originate on the nearby mesas and come down the arroyos, causing damage to canals and growing crops.

Capital

The proper and intelligent use of capital is of primary importance in the development of an irrigation enterprise. The principle of deferred payments has been adopted in the construction of all Federal irrigation projects. At the time the Reclamation Service was organized, the law provided for the repayment of construction charges, drainage, etc., in 10 annual installments. "On August 13, 1914, a law was passed providing for an extension of time of payment from 10 to 20 years . . . Two per cent is required during the first four years, then 4% and next 6%, on the portion of the construction charge unpaid. In all cases the owner must pay the cost of operation and maintenance."[17]

To obtain the best results from the use of irrigation water, fields must be properly prepared, which is a costly operation, sometimes amounting to as much as $50.00 per acre. It is only natural to assume that the average owner with limited capital could prepare only a few acres each year. In some cases men leveled only such an acreage as their finances would permit, leaving a portion of their holdings idle. Others, instead of doing a thorough job of preparing a small acreage, roughly fitted a larger acreage and consequently the land did not produce bountifully. Small yields reduced the returns on such lands and made it difficult for owners to pay interest charges on the capital invested and retire a pro rata share of the construction costs.

The Rio Grande project, at the time construction of the dam was started, differed from many other projects in that all the land was privately owned. Some lands were much more valuable than others, which was in a certain measure reflected in the sale price of land in different sections of the project. This caused great variation in the capital requirements of different owners. The assurance of a reliable water supply

[17] *13th Annual Report*, United States Reclamation Service, p. 15 (1913–1914). The period of repayment has been both extended and contracted in recent legislation. See R. P. Teele, *Economics of Land Reclamation*, (Chicago: A. W. Shaw Co., 1927) pp. 78 ff.

for irrigation purposes and the fact that speculators and prospective home owners became active in the settlement of the project, also tended to increase the price of land. As a result the purchase of a farm necessitated considerable capital, which as a whole was loaned at a high rate of interest. To meet interest payments, retire a certain portion of the indebtedness of construction, and make a living made a "man-sized" job during prosperous years. With the decline in prices of agricultural products and the necessity of paying a greater share of construction costs, the problem for the average farmer has been even more difficult. Generally speaking, farms in the project are at present sufficiently well organized to pay expenses for the management of the farm and their rightful share of the maintenance charges for the irrigating system, and to retire a reasonable amount of the cost for dams and canals annually. Dr. Mead's recommendation, "The payments of the initial years must be made as easy as possible,"[18] could well be adopted as a policy to serve the best interests of all operators in the Rio Grande Irrigation Project. The unstable condition of the agricultural industry has been noticeably felt by the majority of farmers on the Rio Grande project and to meet the payments of the maximum annual construction charge with present conditions so unfavorable may seriously affect the well-being of the project.

Investment and Indebtedness

A study of the capital investment and indebtedness on 69 farms in the Mesilla Valley was made in January, 1927. The total investment per farm was more than $17,000 and the indebtedness exceeded $7,400 per farm, the ratio of indebtedness to investment being 43%. Land and live stock constituted the more important forms of security for loans. Owners borrowed 38% of the capital invested in land and owned 78% of the capital invested in live stock. Loans with personal notes as security were common to the 69 farms under investigation. Seventeen per cent. of the borrowed capital was secured in this manner.

When irrigation works are completed by the Federal government, a levy of costs is pro-rated to each acre included in the project. In the case of the Rio Grande project this amounted to $90 per acre. Capital necessary for the construction of such improvements was lent to the water users' associations without interest at the time the Elephant Butte Dam was built. This loan is secured by a contract with the water users' association and as such constitutes a prior claim upon the land. It is paid back at the rate of $1.80 per acre the first four years that water is available for land, $3.20 per acre the fifth and sixth years, and $5.40 per acre during the seventh to twentieth years inclusive. In addition to these charges landowners must pay annual operation and maintenance charges.

Water facilities are considered an improvement of the land and the charges for such are assessed against the owner rather than the operator. This provides a means of keeping titles clear, as the owner must give proof that the taxes on land and improvements have been paid. In case suitable arrangements have not been made, irrigation water is withheld. After presenting a tax receipt, and paying operation and maintenance charges and that portion of the construction charge due the association, a water user is given the irrigation privilege. If

[18] "Federal Reclamation—What It Should Include," *op. cit.*, p. 15.

these requirements are met, he is entitled to one acre-foot of water. The second acre-foot is charged for at a rate of 75 cents and each acre-foot in addition to this is sold for 40 cents.

The shortcomings of this system of financing an irrigation project are apparent from statements made in some of the previous paragraphs. The lower charges for the first six years have been met without any great sacrifice but the size of payment required for the last 14 years will constitute a serious handicap unless the prices of agricultural products increase. In a specialized agricultural region these charges may not be exorbitant, but to meet the expenses of farm operation, pay taxes, construction costs and the charges for operation and maintenance will call for the most frugal kind of management by the farmer growing the most common crops on the Rio Grande project.

An analysis of the long-time credit situation on a limited number of farms in the Rio Grande project brought some very interesting facts to light. Of the total of 69 farms studied, 58 borrowed capital for a period of three years or more, 34, or 59% of which secured capital from private individuals with first mortgages as security. Eight per cent. interest was paid on an average loan of $4,000 per farm. A Federal Farm Loan Association lent an average of $1,300 at 5½% on 19 farms, or 33% of the number using long-time credit. Loan and mortgage companies made loans on 8 farms, or 10% of the total, using credit for a long-time period. An average loan of $632 per farm was made by companies of this character at an average rate of 8%.

Loans running from six months to three years are secured by chattel mortgages and second mortgages on land. Local banks have played an important part in furnishing capital for intermediate credit needs. Seventeen of the 69 farms studied borrowed an average of $400, paying 9½% interest. A few loans of this character were secured from private individuals, in which case 8% interest was paid.

Farmers who had need for short-time credit loans gave chattel mortgages and personal notes as security. Local banks and private individuals were the more important sources for floating such loans. However, crop-contracting companies were more or less prominent in making loans for cotton production. Banks lent an average of $685 per farm at an average rate of 9½%, with interest paid in advance in the majority of cases. Private individuals lent only a small amount to borrowers for short-time use but interest charges in no case exceeded 8%. Since cotton has proved to be the key crop for the Mesilla and El Paso Valleys, companies often contract the crop and with the assurance of delivery lend money to growers. From the reports secured the average interest rate on money lent by these companies was 20%.

The benefits of the Federal loan agencies are not available to all settlers on the project, and through necessity they are driven to seek financial aid from concerns which charge high rates of interest. Capital for use in the production of crops is paid for at excessive rates in many instances. Dr. Mead's recommendation for this situation is: "Many settlers who love farming and who, if given a chance, will become good farmers have inadequate capital. They should be helped to get a start by means of credit banks or other special arrangements."[19] If these so-called "credit banks" were authorized to lend money for production without too many attend-

[19] "Federal Reclamation—What It Should Include," *op. cit.*, p. 13.

ing difficulties, much would be accomplished in reducing the financial troubles of settlers.

Conclusion

Had all the land in the Rio Grande Project been fenced, cleared, leveled, and prepared for crop production as sson as the dam was completed, thousands of acres would probably have been operated profitably. instead of being a burden to the pioneer farmers. Many families found it very difficult to meet expenses because they had to place their lands in a productive condition before satisfactory yields could be obtained. This was a slow, tedious process. The natural desire was to place as much land under irrigation as possible and the consequent poor preparation and small yields of low quality crops resulted in minimum returns per acre.

Such movements which assist in making all the land pay its way at the outset create the most desirable condition. It is very difficult for a settler to pay construction and other costs for an entire farm when he is able to till only a portion of it, yet this is virtually what happens when a settler attempts to make a home on a new and undeveloped tract with inadequate financial resources or outside aid.

If the present policy of requiring settlers to have at least two years experience and a minimum capital of $2,000.00 in money or equivalent had been in effect at the time the Rio Grande project was inaugurated, many of the natives would have been excluded because of their inability to meet the latter requirement for, though they held title to lands, their holdings were usually small tracts of little value and practically unimproved.

The adoption of a policy to eliminate the activities of speculators would doubtless have been beneficial. Many individuals, seeing the probability of higher land values, made purchases of lands that were certain to be included in the project, held them without doing any development work until the permanency of the project was established, and then sold at a profit. This action was not only detrimental to the rapid settlement of the project but those farmers who settled and improved their lands had to stand a portion of the development and operation costs of lands lying idle.

More than 10 years have elapsed since the Elephant Butte Dam was completed and, while all lands under the project are not being irrigated, the non-irrigated acreage constitutes only a small proportion of the whole. The installation of drainage works and other improvements have practically eliminated all land troubles; farmers as a whole have become adept in the principles and approved practices of irrigation; and speculation in lands has practically ceased in the Rio Grande Federal Irrigation Project, which reflects considerable progress in a single decade. Yet, in spite of the strides in advance, the farmers are still confronted with difficult problems: (1) Obtaining production credit at reasonable rates of interest, and (2) securing an extension of time for payment of construction costs. With prices of agricultural products at a low ebb and the project situated at a great distance from principal markets, the returns to producers are exceedingly small, which makes it difficult for them to pay annual costs of construction, a charge of a dollar and more per acre for operation and maintenance of the irrigation system, taxes that are mounting annually, and reasonable wages of management, to say nothing of interest on capital invested in the business.

THE SIZE OF RETAIL BUSINESS DISTRICTS IN THE CHICAGO METROPOLITAN REGION

By COLEMAN WOODBURY

ANYONE who has followed the published material on planning and zoning in this country during the last 12 or 15 years, or who has given time for a fair review of this material finds in it at least two significant changes. At one time city planning was urged mainly as a problem of engineering and aesthetics. Cities were to be made more beautiful and more systematic. Public attention was focused on parks, bridges, public buildings, and boulevards. Today we find a new note predominating. The general director of plans and surveys of the finest planning organization in the United States begins the foreword to a recently published monograph, "The purpose of making a city or regional plan being to express, in graphic form and in statement of principles, how to develop land for the best economic and social uses . . .," and on the next page writes: "City planners need to join with the economist in recognizing the fundamental interrelations between the location and ground plans of cities, the direction of growth, the distribution of utilities, the currents of travel and the types of building—between all these elements and social conditions of urban growth and the values of land. Too many city plans have been based on financial or political expediency rather than on sound economic principles."[1] The architect, the landscape architect, and the engineer are not replaced but are being reenforced by the land economist. Land utilization is becoming the central word of city planning, as well as of urban land economics. Perhaps it would not be overstating the case to describe the better city planning of today as urban land economics applied.

Closely connected with this development has been the recognition of the region, an economic unit, rather than the city, the political unit, as the proper unit of planning in metropolitan centers. Here again the older idea is not overthrown but enlarged. Control of land uses through zoning ordinances meets jurisdictional difficulties when the political unit seeks to extend its authority beyond the political boundaries. Nevertheless, it has been found that often zoning is ineffective because the area of economic forces is broader than the area of political jurisdiction. Regional and county planning associations are no longer novelties and many cities are trying to extend their control over outlying subdivisions and recreational grounds.

Zoning is both a result and a cause of these shifts of emphasis in urban planning. And with the phenomenal spread of this type of control[2] has come the more or less distinct recognition of three

[1] Thomas Adams, Foreword to "Land Values" by Lewis, Heydecker, and O'Hara, Regional Plan of New York and Its Environs, 1927.

[2] The latest report of the Division of Building and Housing of the United States Department of Commerce states that more than 30,000,000 people in 553 municipalities, comprising over 55% of the urban population of the country, were living under zoning laws on July 1, 1927. Practically all this zoning has taken place since 1916, when New York City enacted the first comprehensive zoning ordinance in the United States.

parts to the problem of zoning a city—the location of the various use districts, the determination of the relative size of the different districts, and the fixing of the height, area, and population density regulations to be applied to each district. In determining these last-named regulations the knowledge and experience of the lawyer, the traffic engineer, the public health officer, the fire marshal, and the social worker must be heavily drawn upon. This is the phase of zoning—the restrictions on the improvements placed upon urban land—that has received the major share of discussion to date. This is perfectly natural. Professional men who have given their time to the study of traffic congestion or public health have valuable information and opinions directly applicable to zoning regulations. Also it was perhaps the most practical way to start. With the evils caused by overcrowding in our larger cities, to wait years for a developed body of economic facts on other phases before attempting any zoning would have been foolish.

But the fact remains that fixing the relative size and location of use districts is as much a part of zoning as the direct regulation of building heights or area. In planning a new district or subdivision this is keenly appreciated. To this part of zoning the economist can make the greatest contribution. A fair amount of material on the location of use districts has given help on one side of the problem. The preference of railways and industrial plants for level sites is well known. The desirability of quietness and of frequent open spaces in the residential sections is readily acknowledged. But *how much* land shall be set aside for industrial purposes or for retail business use? If the municipality has not some reasonably accurate information on this question, its zoning is going to be haphazard to a certain extent. Blind copying of other cities and towns helps matters not at all; the very essence of regional planning is to provide scientifically for differences in the economic organization of the towns and cities within the region. If the district laid out on the zoning map is too small, it must later be expanded at the expense of surrounding districts. This means slow growth, friction, and dissatisfaction.

TABLE I. RETAIL BUSINESS FRONTAGE IN USE IN SELECTED CITIES IN THE CHICAGO REGION

Cities	Business Frontage in Front Feet per 100 Population	Population	Type of City
Momence	90.7	2,480	R*
Elkhorn	89.5	2,430	R
Crown Point	87.0	4,110	R
Bristol and Yorkville	81.2	1,210	R
Morris	79.4	5,680	I†
Burlington	79.1	4,390	I
Libertyville	66.4	3,600	R
Woodstock	66.3	5,706	R
Naperville	64.8	4,500	R
Barrington	63.7	3,000	R
Palatine	61.7	2,500	R
Chicago Heights	58.1	24,200	I
Valparaiso	57.9	7,600	R
Lake Forest	56.4	5,100	R
Evanston	55.8	51,000	R
Melrose Park	55.2	10,150	I
Joliet	54.2	50,000	I
Kenosha	54.0	52,700	I
Homewood	51.7	3,500	R
St. Charles	51.6	5,100	R
Des Plaines	50.9	7,500	I
Downers Grove	49.9	5,700	R
Elgin	49.5	33,500	I
Harvey	49.3	15,300	I
Wheaton	49.1	6,200	R
Whiting	48.9	10,800	I
Blue Island	48.4	16,500	I
Aurora	48.1	45,000	I
Hinsdale	46.4	5,400	R
Gary	45.5	95,000	I
Michigan City	45.0	28,600	I
Wilmette	43.7	12,400	R
Riverside	41.0	5,000	R
Winnetka	39.8	9,800	R
Calumet City	39.5	9,950	R
Glen Ellyn	39.0	6,000	R
Villa Park	38.0	4,300	R
Glencoe	37.5	4,870	R
Park Ridge	36.8	8,000	R
River Forest	22.4	7,440	R
Total 40 Cities		586,216	

*Residential city.
†Industrial city.

On the other hand, if the district laid out is too large, an uneven development results, and the district is marred by many vacant lots which usually represent poor investments to the individual and waste of natural resources to the community.

Method of Investigation

With the intention of supplying information on a small part of this question, this study of the retail business frontages required by different cities and villages within the Chicago metropolitan region was begun in the summer of 1926.[3] The first step was definitely to limit the study to retail business frontage. Fifteen classes of retail business uses were outlined. Care was taken not to include uses which should more properly be set off in a wholesale district or a light manufacturing area.[4]

It should be emphasized that the purpose of this classification was to clarify the bounds of the class of uses called retail business. The object of the study was not to enumerate all the retail uses required by a community but the amount of frontage devoted to that class of uses. In the cities studied excessive height in the central business section was absent and therefore this distinction could be made. If a millinery shop were on the first floor it was counted under class 15 and its frontage recorded; if it were on the second floor, it was not added to the frontage figures nor was it counted. Municipal and other public buildings were not included.

With this preliminary limiting of the subject, the next step was to take a sample of the cities of the region, roughly within a 50-mile radius of Chicago. Nineteen cities were selected as the first sample.[5] These cities were located in all the main directions of suburban growth and at varying distances from the central city. They included purely residential villages and industrial towns, and they ranged in size from 3,500 to 52,700. Their age and rate of growth varied very considerably but only communities which were undoubtedly established and on a "going" basis were used in the sample.[6] Thus the

[3] The first part of the project was outlined and worked out with the aid and direction of the Secretary of the Chicago Regional Planning Association, Mr. Robert Kingery, and the Association Committee on Subdivision Plats and Zoning.

[4] The classification finally was set up as follows: (1) Retail food stores, including meat markets, groceries, bakeries, delicatessens; (2) Drug stores; (3) Dry goods, clothing and shoe stores; (4) Metal works stores and shops, including hardware stores, fixture shops, plumbing shops, tinsmithing shops, roofing shops; (5) Restaurants, tea rooms, confectionaries, soft drink parlors; (6) Auto sales and service, including garages, gas and oil stations, tire repair shops, battery stations; (7) Laundries, cleaners and dyers; (8) Theatres and amusement places; (9) Barber shops and beauty parlors; (10) Banks; (11) Undertaking establishments and furniture stores, these two rather opposed uses being put together because the combination was found to be common in the smaller towns; (12) First floor offices, including telegraph offices, news agencies, real estate offices; (13) Storage uses—warehouses for household goods, excluding lumber, coal or building material storage; (14) Hotels, the first floor only; hotel space entirely above ground floor was not included; (15) Miscellaneous shops, including millinery shops, shoe repair shops, flower shops, printing shops, tailor shops, art stores, antique shops, electric repair shops, music stores, upholstering shops, gift shops, photograph shops.

[5] Evanston, Wilmette, Winnetka, Glencoe, Lake Forest and Kenosha, along the North Shore; Park Ridge and Des Plaines, to the northwest; Melrose Park, Villa Park, Glen Ellyn, and Wheaton to the west; Riverside, Downers Grove, Hinsdale and Naperville along the Chicago, Burlington and Quincy railroad to the southwest; and Homewood, Calumet City and Whiting among the southern suburbs.

[6] During the summer and fall of 1927 this study was continued by Mr. J. M. Albers, Engineer of the Committee on Subdivisional Plats and Zoning of the Regional Plan. Twenty-one more cities were included bringing the total population covered to 586,216 and the total frontage measured to 297,844 feet. This work extended the sample not only to over twice the number of cities of the original but it added a better proportion both of the larger cities, i. e. those of 20,000 and over, and of the country towns of the region, which are entirely surrounded by farming territory as distinguished from the ordinary suburban development.

possible effects of pure "boom" tactics and promotional "ballyhooing" were eliminated.

Maps sufficiently accurate to give the facts desired on business frontage in use were not available in most of the municipalities, and so all the cities in the sample were visited and the frontage measured. Each store measured was checked in its proper class. All retail sections of the city were taken in and straggling, non-conforming uses were included wherever observation or inquiry could locate them. It is important to notice that only buildings occupied at the time of measurement were counted. Vacant stores were not measured because the purpose was to find the amount of frontage demanded by the community, not the amount placed on the market more or less in anticipation of future demand. As each city was visited, its general characteristic, either residential or industrial, was noted.

To be of any significance the frontage figures had to be reduced to a common unit of population. This required reasonably accurate population figures for the time of the frontage measurement. Fortunately, population records and estimates were being assembled by the Committee on General Surveys of the Regional Planning Association in conjunction with the Commonwealth Club of Chicago and the Local Community Research Committee of the University of Chicago.[7] Estimates from such sources as the Illinois Bell Telephone Company, the Chicago and Northwestern Railroad, the Public Service Company of Northern Illinois, and the school census were compared, their methods of computation analyzed, and a final estimate fixed. The estimates for 1926 accepted by the combined committees were used for all the cities whose retail business frontage had been measured. As the cities were visited, the opinions of city officials, real estate men, and others were asked on the population of the city. Their answers were almost always higher than the estimates accepted but the latter were adhered to in every case in order to prevent possible cases of distortion from local pride or optimism.

With the frontage and population figures determined, all that remained was to reduce the frontage figures to a ratio per unit of population. The family seemed a fairly useful unit but later all ratios were changed to retail business frontage per 100 persons of population. This unit is not subject to the same variations among classes of population as is the family and is more easily applied to future estimated populations.

Results of Investigation

The results are presented in Table I. Probably the most noticeable characteristic is the wide range in the frontage ratios from 22.4 feet per 100 population to 90.7.[8] However, a fair concentration exists; 20 cities or 50% of the total number are found in the relatively small range from 45.0 to 60.0 feet per 100 population. Looking more carefully at the cities above and below this group two generalizations seem justified. The cities with the larger ratios are as a class farthest from the central city, Chicago; those with the smaller ratios are fairly centrally located and all are residential towns of small population.

[7] The results of this population study have been published, Helen R. Jeter, *Trends of Population in the Region of Chicago*, (University of Chicago Press, 1927).

[8] The average frontage per store varied only slightly from town to town with an average for the 40 towns of 31.1 feet per store. This should be borne in mind in any planning or zoning application of the foregoing figures.

This observation suggests three possible answers to the question, why do some cities have relatively larger business districts than others. The ratio of business frontage per 100 of population may vary with (1) the type of city, whether residential or industrial; (2) the size of the city; and (3) the distance of the city from the central city, Chicago.

In order to determine accurately the effect of any one of these factors it would be necessary to have a number of cities in each class with the characteristics of the other two classes uniform. For example, to say that industrial cities have a larger or smaller ratio than residential cities requires for comparison a number of industrial cities and of residential cities of the same size and the same distance from Chicago. Obviously, the sample is too small to yield accurate results from such analysis. Despite this recognized limitation, an attempt was made to measure, in a general way, the effects of these possible factors. For this purpose, the cities were grouped according to one factor at a time disregarding the other two. For example, all industrial towns were taken together regardless of size or location; all cities of more than 20,000 population were included in one class without reference to location or type.

Table II contains averages summarizing the ratios of the entire sample and of the classifications made under the first two characteristics suggested as possible forces determining the size of the business district, i. e., type and size of city.

The modes, column (d), are probably the best single averages for summarizing these data and when considered alone they seem to indicate that the industrial cities have larger ratios than the residential cities and that the larger sized cities have higher ratios than the smaller ones. But when the other types of averages are taken into account this generalization is open to serious question.[9] The consideration of these averages seems to justify the conclusion that, as far as it is possible to determine within the limitations of the data previously referred to, the character of the city and its size either have no marked effect on the amount of business frontage required per 100 population, or else their

[9] The mode is the most common or characteristic item of a series and hence is unaffected by the extremes; the median is the middle item of a series arranged in order of size and is most affected by the central items. The arithmetic mean is what is popularly understood as an "average," i. e., the sum of the items divided by the number of items. The means of column (f) give weight to the extreme items and hence is rather high. The figures in column (g) are not, strictly speaking, averages but are the ratios of total population and aggregate frontages of the different classes.

TABLE II. AVERAGES OF RETAIL BUSINESS FRONTAGE IN USE IN THE CHICAGO REGION BY CLASSES OF CITIES

Classes	Population	Number of Cities	Modes of Ratios of Cities (in Front Feet per 100 Population)	Medians of Ratios of Cities	Means of Ratios of Cities	Ratios of Aggregate Frontage and Population
(a)	(b)	(c)	(d)	(e)	(f)	(g)
40 Cities	586,216	40	50.0	51.3	54.8	50.8
Residential Cities	186,896	26	45.0	50.8	54.9	51.2
Industrial Cities	399,320	14	55.0	50.2	54.7	50.6
Cities—20,000 and over	380,000	8	55.0	48.8	51.3	50.6
Cities—10,000–20,000	65,150	5	50.0	48.9	49.1	48.9
Cities under 10,000	141,066	27	45.0	51.7	56.9	52.2

effects offset each other or have been neutralized by other forces.

Turning to the third factor, distance from Chicago, a more positive statement seems warranted. The cities were arranged in order of distance from Chicago and then grouped as shown in Table III. The distance from Chicago was not measured by miles but by the average express time from Chicago by either steam or electric train. That is, for cities having both electric and steam service, the shorter average time was taken. These times were computed from time tables in effect at the time of the measurement of business frontage. Thus a rough measure of the accessibility of the central business and shopping district of Chicago to the outlying towns was obtained. It is perfectly true that the measure is only a rough one, omitting many possible factors. Accessibility by automobile, private or public, is not included, and the number of trains per day is disregarded; the cost of the trip is assumed to be fairly uniform within the same time zones. Again, the times are to steam train termini and to the "loop" on electric trains, a distinction of importance in some cases, and no shopping or business district in Chicago is considered except the central one, the "loop."

But accepting average express time as a measure of the accessibility of the central city, Table III shows two interesting tendencies. As the distance from Chicago, measured in time, increases, the ratio of business frontage required also increases. In addition, the very rapid rise in the ratio in the 50–60 minute zone, an increase of 10.6 front feet per 100 over the 40–50 minute zone figure, seems to indicate that when the distance from Chicago exceeds 50 minutes the effect of the central business district of Chicago on the shopping habits of the people of the smaller cities diminishes rapidly.

The results can, of course, be explained by pointing to the amount of buying in Chicago stores, particularly of conveniences and luxuries, done by the people in communities with easy access to the central city. A related condition which probably largely explains most of the very high ratios is that as the cities included are nearer the outer edge of the region their shops and stores serve not only their city population but the surrounding rural population. Still remembering the limitations of these data, the fact seems clear that accessibility of the central city of a metropolitan region to the outlying cities is a most important factor in determining the relative size of their retail business districts.

TABLE III. RETAIL BUSINESS FRONTAGE IN USE IN SELECTED CITIES IN THE CHICAGO REGION BY TIME ZONES FROM CHICAGO

Time from Chicago (in Minutes)	Number of Cities	Mean Average of Ratios of Cities
(a)	(b)	(c)
120 and over	2	84.3
110–120	1	81.2
100–110	1	79.4
90–100	3	64.5
80– 90	1	66.3
70– 80	3	64.2
60– 70	3	56.7
50– 60	7	56.9
40– 50	6	46.3
30– 40	7	44.3
20– 30	6	42.5

Circumstances peculiar to the location or structure of a city may alter its frontage ratio markedly. For example, Melrose Park is an industrial town of rather small size near Chicago, in the 20–30 minute time zone. Normally a small ratio of about 40–45 front feet per 100 would be expected. Instead, Melrose Park is found well up the list with a ratio of 55.2. The explanation is quite

simple, however. Much of the frontage is on Lake Street, a through thoroughfare with a large amount of frontage in garages and service stations serving an unusual number of travelers. The chief business district is in the southern part of the city extending practically to the boundary line of Melrose Park and Bellwood. Probably the district serves a considerable number of Bellwood shoppers and the result is a higher ratio of business frontage per 100 of the population of Melrose Park. Economic analysis and conversely economic planning or forecasting must not neglect individual variations or modifications of this sort in the glamor of arithmetic precision and definiteness.

Conclusions

The findings of this study, and the analysis to which the results lend themselves, may be summarized in four statements.

1. The most common size of retail business district in the outlying municipalities of the metropolitan area is from 45–55 front feet per 100 persons of the city population.

2. The size and general character of the city seems to have no clear effect on the relative size of the business districts.

3. The ratio of business frontage to population increases with increased distance from the central city. In other words, the size of the business district varies inversely with the accessibility of the central business and shopping district of the region.

4. This study is not exhaustive nor are its results final. It is not a substitute for the services of an experienced city planner or zoning expert. It must not be used blindly as an exercise in multiplication, but it may aid the more economic proportioning of urban land within metropolitan areas.

The study was undertaken as an aid to planning and zoning and as a possible contribution to the specific information available on land utilization. There are indications, however, that the results may have other uses especially when supplemented by further investigations. Real estate men who wish to develop a district in accord with sound economic principles, as well as with successful business tactics, may find this information of some use. Persons buying lots marked "commercial" or "business" in new subdivisions may be able to form a more accurate estimate of the soundness of their investments and to protect themselves from the land salesman whose sole purpose is to "unload" the lots at the highest possible price regardless of the possibility of future utilization. With so much talk of the decentralization of urban centers perhaps this study, if repeated later in the same manner, might furnish interesting facts on the extent and character of the movement of retail business. Possibly it may lead to the publication of similar figures in other regions which will furnish significant comparisons of the economic organization of metropolitan areas which today are often summarily described by such undeniably correct but unsatisfactory adjectives as agglomerated or complex.

DEPARTMENTS

The departments of the JOURNAL are edited specifically with regard to their interest to the readers who are especially concerned with the economic problems of land and public utilities. For the most part the material for the departments will be prepared by members of the staff of the Institute for Research in Land Economics and Public Utilities.

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SUMMARIES OF RESEARCH

TAXATION OF ELECTRIC RAILWAYS, 1920 TO 1926

THIS study of the tax burden of electric railways was made from data in the reports to the Interstate Commerce Commission. The investigation shows that although the absolute amount of taxes has latterly fallen, the burden of taxes on investors has in recent years increased, reflecting the declining prosperity of the industry, whereas the tax burden on consumers has fluctuated. These findings are tested by various tax ratios for electric railways reporting complete information to the Commission and for regional groups of these railways.

Certain limitations upon the representative character of these data should be noted at the outset, lest a hasty reader interpret the above statement as derived from reliable information covering all electric railways. The group of electric railway companies reporting to the Interstate Commerce Commission contains approximately one-fourth of all electric railways, the proportion of the total railway operating revenue of these companies in 1922 being about 25% of that reported by the Census of Electric Railways. If this sample were representative, it would probably be large enough to give an accurate picture of the entire industry. However, the group reporting to the Interstate Commerce Commission undoubtedly contains a greater proportion of interurban railways than does the entire group as reported by the census. Interurban roads as a group were probably harder hit by the depression which electric railways have been experiencing than were the street railways. For this reason the burden of taxes as found in this study is probably heavier than the actual burden for the entire industry.

TABLE I. RATIOS OF TAXES ASSIGNABLE TO RAILWAY OPERATIONS TO INVESTMENT IN ROAD AND EQUIPMENT OF ELECTRIC RAILWAYS REPORTING TO THE INTERSTATE COMMERCE COMMISSION, BY DISTRICTS, 1920–1926

(*In Percentages*)

District	1920	1921	1922	1923	1924	1925	1926
Total	.95	1.01	1.02	1.02	.99	.96	.95
Eastern	.96	1.02	1.04	1.04	.98	.93	.88
Southern	.96	.96	.86	1.11	1.09	1.19	1.33
Western	.95	.99	.98	.99	.99	.97	1.02

TABLE II. RATIOS OF TAXES ASSIGNABLE TO RAILWAY OPERATIONS TO RAILWAY OPERATING REVENUE OF ELECTRIC RAILWAYS REPORTING TO THE INTERSTATE COMMERCE COMMISSION, BY DISTRICTS, 1920–1926

(*In Percentages*)

District	1920	1921	1922	1923	1924	1925	1926
Total	5.66	6.39	6.49	6.32	6.70	6.51	6.25
Eastern	5.64	6.47	6.79	6.96	7.01	6.84	6.31
Southern	9.52	9.45	8.25	8.85	9.70	9.29	10.70
Western	5.57	6.02	5.92	5.40	6.24	6.00	5.89

A comparison of the ratios for 1922 calculated from the census data and from these reports to the Commission bears out this hypothesis. Using the census data, the ratio of taxes to railway operating revenue in that year was 7.0%, whereas the ratio found in this study was 6.5%. However, the taxes reported to the census as railway taxes probably include most of the other taxes as well. If these taxes are compared to the railway revenues plus auxiliary revenues, the ratio is found to be 6.4%. The ratio of taxes to net railway operating revenues as reported to the Interstate Commerce Commission in 1922 was 30.4%, and according to the census data, 26.2%. Using total net operating revenue as reported by the census, the ratio was 22.4.%.

Thus, it seems to be true that this study does not accurately represent the

TABLE III. RATIOS OF TAXES ASSIGNABLE TO RAILWAY OPERATIONS TO RAILWAY OPERATING EXPENSE OF ELECTRIC RAILWAYS REPORTING TO THE INTERSTATE COMMERCE COMMISSION, BY DISTRICTS, 1920–1926

(*In Percentages*)

District	1920	1921	1922	1923	1924	1925	1926
Total	6.97	7.96	8.25	8.01	8.23	8.02	7.44
Eastern	6.96	8.10	8.61	8.79	8.55	8.49	7.56
Southern	10.79	11.91	11.16	12.67	12.29	12.42	14.14
Western	6.84	7.43	7.55	6.83	7.73	7.31	6.92

burden of taxes upon all electric railways, at least as measured by the ratio of taxes to net operating revenue. It may also be true that the varying amount of this burden in different years for the entire industry is not truly reflected in the results found here. Possibly while the operating conditions of interurbans were stationary or becoming worse, those for street railways were improving. However, this study does represent the facts about that group of electric railways reporting to the Interstate Commerce Commission.

For the purposes of this study all companies were eliminated which reported for only part of a year, and also those where the investments or taxes reported as assignable to railway operations were obviously erroneous. In other words, where it was apparent that the investment in, or taxes of, other services had been reported as belonging to railway operations, the company was eliminated.

Measurement of the Tax Burden

The burden of taxes on an industry is clearly the result of two factors: The amount of taxes, and the operating conditions and profitableness of the industry. The movement of taxes may be downward while, on account of decreasing profitableness, the burden of taxes on the industry increases. As indicative of the operating conditions of the electric railway industry the operating ratio (ratio of expenses to revenues) and capital turnover (ratio of revenues to investment in road and equipment) have been used. Capital turnover is ordinarily figured in terms of the total investment, but as this was not available, investment in road and equipment was used instead. For purposes of comparing different years it should serve as well.

As a measure of the absolute amount of taxes the ratio of taxes to investment in road and equipment has been used (Table I). Table I shows that this ratio rises from 1920 to 1922, remains stationary in 1923, and falls for the rest of the period considered. Both investment in road and equipment and taxes levied have fallen since 1923, but taxes have decreased more rapidly than investment.

The ratio of taxes to operating revenues is ordinarily used as a measure of the burden of the tax on the customers of an industry. This ratio in 1926 was 6.25% (Table II), indicating that out of every dollar paid for electric railway service, 6¼ cents went to the government. As shown in Table II the movement of this ratio for the first three years of the period under consideration corresponds to that of the ratio of taxes to investment. In 1923 while the absolute amount of taxes remained constant, the ratio of taxes to revenues fell. The explanation of this lies in the increase in capital turnover from 15.67% to 16.20% (Table VI). The investment was used more intensively than in 1922, and as a result the burden of the same absolute amount of taxes was distributed over a greater number of users of electric railway services. The increase of the ratio

TABLE IV. RATIOS OF TAXES ASSIGNABLE TO RAILWAY OPERATIONS TO NET RAILWAY OPERATING REVENUE, BEFORE TAXES, OF ELECTRIC RAILWAYS REPORTING TO THE INTERSTATE COMMERCE COMMISSION, BY DISTRICTS, 1920–1926

(*In Percentages*)

District	1920	1921	1922	1923	1924	1925	1926
Total	30.17	32.32	30.41	30.00	35.89	34.53	38.91
Eastern	29.70	32.18	32.24	33.43	38.80	35.25	38.16
Southern	80.73	45.89	31.70	29.30	45.95	36.81	43.94
Western	30.05	31.74	27.48	25.63	32.40	33.54	39.38

of taxes to operating revenues in 1924, despite a fall in the absolute amount of taxes, is also explained by the rate of capital turnover, which in this year decreased from 16.20% to 14.78%. Thereafter, the two ratios move together, but the ratio of taxes to revenues remains high, for the rate of capital turnover stays low. The movements of the ratio of taxes to railway operating expenses correspond to those of the ratio of taxes to revenues (Table III).

The best measure of the burden of taxes on the investors in an industry seems to be the ratio of taxes to net income. However, the data in the reports to the Commission were not complete enough to obtain this figure, and the ratio of taxes to net railway operating revenues before taxes was used instead. In 1926 this ratio was 38.91% (Table IV). The movement of this ratio indicates that the burden of taxes on investors is considerable larger for the past three years than during the first part of the period. This has not been the result of increasing taxes, however, for the ratio of taxes to investment has steadily decreased. It must then be occasioned by decreasing prosperity of the industry. The operating ratio is an indicator of the profitableness of the industry, and its movements bear out the above hypothesis. It increased from 78.94% in 1923 to 83.95% in 1926 (Table V). The differences between the movements of the ratio of taxes to net revenues and that of taxes to gross revenues are all explained by the movements of the operating ratio.

TABLE V. RATIOS OF RAILWAY OPERATING EXPENSES TO RAILWAY OPERATING REVENUES (OPERATING RATIO) OF ELECTRIC RAILWAYS REPORTING TO THE INTERSTATE COMMERCE COMMISSION, BY DISTRICTS, 1920–1926

(*In Percentages*)

District	1920	1921	1922	1923	1924	1925	1926
Total	81.23	80.24	78.67	78.94	81.34	81.16	83.95
Eastern	81.02	79.88	78.93	79.19	81.94	80.60	83.47
Southern	88.21	79.39	73.97	69.81	78.89	74.77	75.66
Western	81.45	81.03	78.46	78.95	80.75	82.10	85.05

TABLE VI. RATIOS OF RAILWAY OPERATING REVENUE TO INVESTMENT IN ROAD AND EQUIPMENT (CAPITAL TURNOVER) OF ELECTRIC RAILWAYS REPORTING TO THE INTERSTATE COMMERCE COMMISSION, BY DISTRICTS, 1920–1926

(*In Percentages*)

District	1920	1921	1922	1923	1924	1925	1926
Total	16.86	15.80	15.67	16.20	14.78	14.68	15.23
Eastern	16.99	15.76	15.35	15.00	14.01	13.56	13.97
Southern	10.09	10.19	10.47	12.65	11.19	12.84	12.43
Western	16.98	16.45	16.56	18.30	15.95	16.23	17.38

Differences in Burden Among Regional Groups

During the first part of the period considered the amount of taxes levied in the eastern district, as indicated by the ratio of taxes to investment in road and equipment, was higher than in the western district, but in the last three years the eastern district has fallen below the western (Table I). In the eastern district this ratio has shown a distinct downward trend recently, but the ratio of taxes to investment for the western district has stayed on much the same level with a slight rise in 1926. The southern district ratios apparently indicate that the taxes there have risen greatly since 1922, starting below the other districts and rising considerably above them. However, the number of companies in the southern district is very small, varying from 6 to 9, and the results are consequently too much influenced by the movements of one or two companies to yield a dependable generalization. For instance, if two companies are dropped from the totals for 1926, the ratio of taxes to investment falls from 1.33% to .98%. For this reason it is hardly possible to say whether the taxes levied in the southern district have been greater or less than in the other districts.

The burden of taxes on customers, as measured by the ratio of taxes to operating revenues, is uniformly higher for the eastern district than for the western

district (Table II). This is attributable not so much to a smaller amount of taxes being levied as to a higher rate of capital turnover obtaining in the western district. In the last three years considered here, this higher rate of capital turnover has kept the ratio of taxes to revenues below that of the eastern district, while the amount of taxes levied in the eastern district as indicated by the ratio of taxes to investment has fallen below that for the western district. The ratio of taxes to operating revenue has been materially higher in the southern district than in either the eastern or the western. The chief cause of this higher ratio is probably the fact that the rate of capital turnover has been much below that for the other districts, particularly in the earlier years of the period. At any rate, it is true that the burden of taxes on customers has been greatest in the southern district.

The ratio of taxes to net operating revenue before taxes for the western district is also consistently below that for the eastern district, except in 1920 and 1926 when they are substantially the same (Table IV). Thus, the burden of taxes on investors as well as on customers has been less than in the eastern district. The southern district's ratio of taxes to net revenue has not been uniformly higher than the other districts, but on the whole is probably somewhat higher. This ratio is not as much higher as the ratio of taxes to revenues, except in the years 1920 and 1921, because of the lower operating ratio of the southern district. The ratio of taxes to net revenues of 80.73% for 1920 is particularly noticeable and may be explained by the high operating ratio of 88.21%.

BARCLAY J. SICKLER

GROSS AND NET EARNINGS OF PUBLIC UTILITY ENTERPRISES EXCLUSIVE OF STEAM RAILWAY, TELEPHONE AND TELEGRAPH UTILITIES

THE Department of Commerce last November released its summary of public utility earnings which had been in preparation for some time. Statistics on steam railways had long been available and earnings reports for certain classes of telephone and telegraph companies had been reported for some years by the Interstate Commerce Commission. The monthly records of gross and net earnings for electric light and power, gas, water, and electric traction utilities are now available, adding materially to the facts available about the utility industries. The reports received cover 95 companies or systems comprising practically all the important utility organizations rendering the aforementioned services in the United States.

The Department summary presents as nearly comparable figures as possible by years from 1913 to 1919 and by months from 1920 on. In some cases the figures for earlier years could not be made to cover exactly the same subsidiaries owing to acquisitions and consolidations, but these differences, the

compilers believe, are not significant when related to the aggregates.

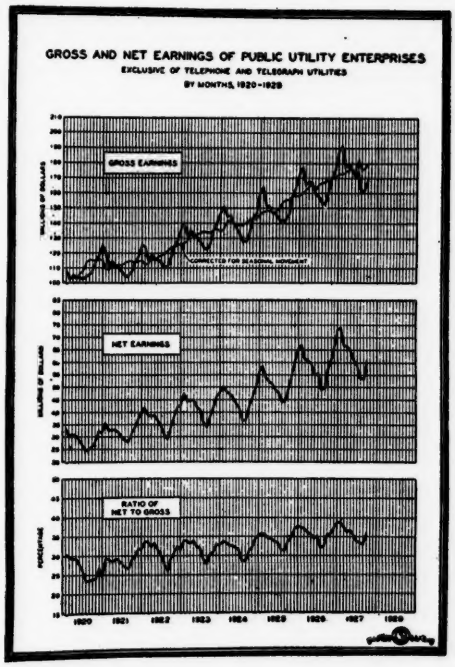
Gross earnings as reported consist of total operating revenues while net earnings in general represent gross less operating expenses and taxes or the nearest comparable figures. The total gross and net earnings by years are reported thus:

	Gross Earnings (Thousands of Dollars)	Net Earnings (Thousands of Dollars)
1913	$ 629,913	$257,175
1914	651,781	267,896
1915	680,020	282,149
1916	756,466	312,615
1917	844,992	308,444
1918	944,698	292,645
1919	1,081,949	313,888
1920	1,306,453	347,383
1921	1,352,281	394,614
1922	1,435,218	446,858
1923	1,592,533	509,599
1924	1,691,267	546,127
1925	1,827,125	632,222
1926	1,995,365	715,027

The gross and net earnings by months are shown on the accompanying chart on which is also presented the results of calculating the month by month changes in the ratio of net earnings to gross and a trend line showing the movement of gross earnings after elimination of the very obvious and regular seasonal movement.

The tremendous rise in the gross earnings of these groups of utility industries is apparent. From 1913 to 1926 the gross has more than trebled and net substantially so.

The changing ratio of net to gross by months from 1920 to 1926 is shown by the chart to have risen from a level



around 30% in the years 1921 to 1923 to around 35% in 1925 and 1926. The ratio of gross to net for companies reported by years records the effect of economic conditions and changes in the period 1913 to 1926. In the years 1913 to 1917 the average ratio was 40% to 41%. From 1917 to 1921 it fell from 36.50% to 30.98% to 29.01% to 26.59%. The rise began in 1921 with an increase to 29.18% followed by 31.14% in 1922, 32.00% in 1923, 32.29% in 1924, 34.60% in 1925 and 35.83% in 1926.

H. B. Dorau

PUBLIC UTILITY FINANCING DURING THE THIRD QUARTER, 1927.

CONFIDENCE of investors in public utility issues coupled with the influence of the business cycle on the money market is reflected in the growing proportion of public utility capital obtained by the issue of stock.

For the period from 1919 through nine months of 1927, the average proportion of new public utility stock issues

TABLE I. VOLUME OF NEW PUBLIC UTILITY FINANCING BY CLASSES OF ISSUES, BY YEARS, 1919-1927

YEAR	LONG-TERM BONDS		SHORT-TERM BONDS		STOCK	
	Volume*	Percentage of Total	Volume*	Percentage of Total	Volume*	Percentage of Total
1919	$ 117,046,000	41.98%	$126,486,800	45.36%	$ 35,304,950	12.66%
1920	199,998,100	52.31	127,026,252	33.22	55,314,700	14.47
1921	349,975,000	71.14	24,872,000	5.06	117,087,940	23.80
1922	431,081,339	59.36	19,445,000	2.68	275,715,170	37.96
1923	588,821,471	66.31	48,712,200	5.49	250,457,058	28.20
1924	722,018,123	54.47	107,032,000	8.07	496,550,704	37.46
1925	857,787,400	57.33	117,540,000	7.86	520,771,004	34.81
1926	1,047,216,330	65.27	92,283,100	5.75	464,885,946	28.98
1927 (9 months)	811,094,600	58.49	46,600,800	3.36	529,034,986	38.15
1927 (11 months)	1,030,355,910	60.35	68,650,800	4.02	608,042,178	35.61
Average for Period†	.....	59.73	.....	8.27	.....	32.00

* Par values.

† Average for 1919–1926 and three-quarters of 1927.

to total new financing was 32% compared with 59.73% for long-term bonds, and 8.27% for short-term bonds and notes. But for the first nine months of 1927 stock financing accounted for 38.15% of the total, and for the first eleven months it was 35.61% of the total. Moreover, for the first time in several years, the volume of long-term bonds declined sharply along with short-term financing. The figures are not strictly comparable in that the bonds were in most cases sold at a discount, and the stock was issued at par. The record for new public utility financing by years and general types of issues is given in Table I.

The yield to the investor on all securities of all maturities issued by public utilities in the third quarter was 5.32% on the dollar and 5.61% on the issue. The average yield per dollar in all issues of debt obligations declined slightly from the low figure of the second quarter (See Table II).

TABLE II. WEIGHTED AND SIMPLE AVERAGE YIELD AT OFFERING PRICE OF NEW PUBLIC UTILITY SECURITY ISSUES

YEAR	ALL TYPES OF SECURITIES						BONDS AND NOTES	
	All Maturities		Long Term		Short Term			
	Weighted Average Yield	Simple Average Yield	Weighted Average Yield	Simple Average Yield	Weighted Average Yield	Simple Average Yield	Weighted Average Yield	Simple Average Yield
1919	6.55	6.68	6.21	6.25	6.78	7.03	6.54	6.67
1920	7.55	7.64	7.52	7.59	7.59	7.68	7.53	7.62
1921	7.13	7.47	7.11	7.42	7.27	7.66	7.11	7.45
1922	6.06	6.34	6.03	6.32	6.39	6.53	6.03	6.34
1923	6.04	6.31	5.99	6.26	6.73	6.72	6.11	6.29
1924	6.03	6.14	6.04	6.16	5.97	6.04	5.98	6.12
1925	5.58	5.81	5.66	5.83	5.55	5.86	5.56	5.78
1926	5.53	5.72	5.52	5.70	5.77	5.82	5.44	5.66
1st Quarter, 1927	5.43	5.71	5.42	5.71	5.70	5.73	5.33	5.66
2nd Quarter	5.34	5.61	5.34	5.57	5.35	5.84	5.17	5.58
3rd Quarter	5.32	5.61	5.30	5.54	5.54	5.94	5.27	5.57
4th Quarter	.....	.....	.....	.....	.....	.....	.....	.....

TABLE III. INDEX NUMBER OF VOLUME OF PUBLIC UTILITY FINANCING, 1919-1927*

	1919	1920	1921	1922	1923	1924	1925	1926	1927
By Months									
January	100	67	55	46	122	112	199	173	259
February	48	28	25	47	66	89	172	125	314
March	25	27	25	43	94	78	144	115	158
April	5	38	25	50	64	112	69	182	165
May	15	38	35	150	66	233	103	230	214
June	26	20	9	96	92	122	118	181	130
July	41	25	115	44	21	104	90	177	97
August	20	11	33	22	40	62	93	58	92
September	54	44	34	147	34	77	110	38	168
October	24	33	33	77	59	112	92	123	.....
November	8	21	119	43	161	69	102	136	.....
December	20	63	53	54	135	111	153	114	.....
By Quarters									
1st Quarter	100	71	61	80	164	162	299	240	424
2nd Quarter	27	56	41	172	129	271	168	344	295
3rd Quarter	67	47	105	123	55	141	170	159	207
4th Quarter	30	68	119	101	206	169	201	217	.....
By Years	100	107	145	212	246	330	373	427	.....

* Volume for January, 1919, First Quarter, 1919, and Year 1919, used as basis for computing index numbers for months, quarters, and years respectively. Compiled from the monthly record of new capital flotations of the *Commercial and Financial Chronicle*.

The volume of public utility financing for the third quarter was somewhat less than for the preceding quarter but was still the largest third-quarter volume in the period of this study, with an index number of 207. (See Table III.) The volume of public utility issues was 24.66% of the total corporate and government financing of all kinds for the quarter, compared with 21.83% for the second quarter, 34.71% for the first quarter, and an average of 27.13% for the first nine months. The volume of public utility securities, quarter by quarter, was approximately the same as that of government financing.

The issues by utilities were 33.58% of the total corporate financing in the third quarter compared with 31.29% in the second, 46.13% in the first, and an average of 37.37% for the nine months. Compared with 1926, the third quarter showed a gain over the same period a year ago, although the average for nine months of 1926 was 38.93%, showing a decline for the same period in 1927.

The gas and electric companies offered $97,882,700 or 23% of the quarter's utility financing. Gas and gas-electric companies together claimed $139,137,481 or 32.7%.

PETER LEININGER

COMMENTS ON LEGISLATION AND COURT DECISIONS

THE FORESTRY ACT OF 1927 OF THE PROVINCE OF ONTARIO

The Forestry Act of Ontario is of especial interest to students of land economics because in several particulars it marks progress in the classification of land and in the adjustment of human relations with respect to the utilization of land.

In the first place, the "Minister of Lands and Forests" is given power to expropriate any land in Ontario which he may deem necessary for forestry purposes; and by expropriation, it is scarcely necessary to say, is meant the taking of property *with* compensation, as under the American law of eminent domain. This provision manifests the urgency of the problem of conserving and replenishing our vanishing forests. In this respect many communities in this country lag behind our neighboring Province.

In the second place, those who framed this Act had in mind the disadvantages of excessively scattered settlement of land and the gains of what people in New Zealand and Australia call "closer settlement." The Act provides that when less than 10% of the area of a township is used for farming purposes, the township may be made part of the Crown Forest Reserve; and any balance of the township not used for forestry purposes may be attached to an adjoining township. This part of the Act reads as follows:

". . . where any township has an area of less than 10% of such township used for farming purposes the Lieutenant-Governor in Council may for forestry purposes, by proclamation, declare that the township or such part of the said township as may be designated by the said order-in-council shall form part of a Crown Forest Reserve, or be otherwise used for forestry purposes, upon such terms as may be set out in the said order-in-council, and for municipal or administrative purposes any balance of the said township may be attached to any adjoining township. The said order-in-council may contain such provisions as may seem proper and necessary for any school section that may be affected by the said order-in-council."

This clause affords a suggestive line of action to many American states which are troubled with counties and townships too greatly burdened by taxes because of withdrawals of land from taxable uses. In the northern part of Wisconsin, for example, lands are reverting to the state for non-payment of taxes. In this and other ways an almost crushing burden of taxation is thrown on those who remain. The Ontario method of building up consolidated forest areas and consolidated farming areas, with re-drawing of township lines, might prove of some use in relieving disproportionately heavy tax burdens in sparsely settled regions.

The Act furthermore provides that the Minister, or any agent representing him, has the right of entry upon any land to whomsoever belonging for the purpose of extracting the natural resources of the land, and also has power to close roads on lands taken over for forestry.

But the most significant portions of the Act provide for transferring settlers from lands unsuitable for farming to other lands that are suitable and paying

the expenses of these removals out of public funds. These sections of the Act read as follows:

"Upon the recommendation of the Minister, the Lieutenant-Governor in Council may, by proclamation, provide that any township or portion of a township in Ontario suitable for settlement purposes, may be set aside for the purpose of location of settlers whom the Minister may desire to move from locations that have been found to be unsuitable for agricultural purposes, and which it is desired to take over for forestry purposes; and the terms and conditions of location upon such lands may be fixed and determined by the said order-in-council.

"Whenever in the opinion of the Minister it is found that settlement has taken place on lands not suitable for agricultural purposes, the Minister shall have power to make arrangements for the removal of such settlers upon such terms as may be agreed upon, and may pay the expenses of the removal of such settlers and their families, chattels and effects to lands designated under the preceding section and may enter into agreements with such settlers for the purposes of providing for such removal and for the reconveyance or release of the said lands to the Crown."

In this Act the Province of Ontario has taken up one of the farming problems of our time in a thoroughly scientific way and has set a pace for us in the United States. It may seem like only a small part of the troubles of farmers but the law is not insignificant as a measure of farm relief. One cause of the farmers' distress is the fact that so much land is being farmed that is unsuitable for farming, because for one reason or another it is submarginal for that use. At the same time, the public has a large measure of responsibility for the fact of unsuitable settlement which involves vast loss of treasure and countless human tragedies. In some cases land was surveyed and opened by the general government to settlers who could not be expected to judge of its suitability. In other cases, states invited settlements on their land.[1] John Stuart Mill, in advocating laissez-faire, makes exception of those cases where the consumer is unable to judge of the quality of his purchase and says that in these cases we are justified in using public authority to protect the purchaser. Such aid is required especially in the selection and purchase of land, most particularly in a new country, and this has not been afforded. But this is not all. Many government publications have been misleading and have held out pictures of prosperity on lands offered to settlers that would be regarded as discreditable if issued by any respectable real estate agent. Thus on grounds of public policy, justice and general welfare we have every reason for helping to redress such mistakes made in the settlement of land.

We can afford to spend a good many millions of dollars in getting men off submarginal land and on better land; also in promoting closer settlement. But these expenditures should not be made in an off-hand manner. Certain policies of this nature are known to be desirable on the basis of existing information; and if state land commissions with powers similar to those in Ontario were established, they might initiate these policies at once. Some other aspects of the Ontario policies need more study in the light of American conditions. We should not proceed along these lines until we have made a careful inventory of our land resources, classifying them according to their fitness for various uses. The example of the Michigan Land Economic Survey is well worth emulation and further experimentation. Only after scientific

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[1] See B. Henderson, "State Policies in Agricultural Settlement," 2 *Journal of Land and Public Utility Economics*, pp. 284–296 (1926).

surveys such as this, which increase our working knowledge about land, will money spent on transferring settlers from submarginal to suitable land and in reforesting poor farming areas bring abundant returns, in money's worth as well as in happier human beings.

RICHARD T. ELY

NEW JERSEY ZONING AMENDMENT

THE adoption by popular referendum of an amendment to the New Jersey constitution authorizing city zoning is of more than passing interest in the legal history of the movement. For years the position of zoning in New Jersey has been most unsatisfactory. Although New Jersey has always been first or second among all the states of the United States in the number of zoning ordinances passed, the attitude of the state courts has been decidedly hostile. At first this attitude seemed justified by the patchwork of state enabling acts, which were poorly drawn and failed in the important regard of providing adequately for the formation and operation of boards of appeal.

The leading case involved the erection of a store in a residential district, *Ignaciunas* v. *Risley, Inspector of Buildings of Town of Nutley, et al.*,[1] in which the Supreme Court of New Jersey said in part: "With the right of ownership and possession goes the right to use, enjoy and dispose of the property owned. The substantial value of property lies in its use. If the right of use be denied, the value of the property is lessened or destroyed. A law which forbids a certain use of property deprives it of an essential attribute. The result is in effect a proscription of its ownership. . . The ordinance will not be set aside in its entirety but it will be held invalid as to the prohibition sought to be enforced against the relator." This decision was upheld by the Court of Errors and Appeals,[2] the highest court of the state.

In 1924, after a series of decisions holding zoning ordinances unconstitutional, the apparent defect in the zoning machinery, the enabling act, was remedied by the passage of a substitute enabling act following rather closely the Standard Enabling Act of the Advisory Committee on Zoning of the Department of Commerce. This model act had secured judicial approval in most states. But the hopes of the many proponents of zoning in New Jersey were short-lived. In 1925, in the case of *H. Krumgold and Sons, Inc.*, v. *Mayor and Aldermen of Jersey City, et al.*,[3] the court said: "The answer to this proposition is that the ordinance is ineffective to deprive the respondent of its right to the use of its property for store purposes. The ordinance being void, so far as it prohibits the proposed use of respondent's property, no appeal thereunder to the board of appeal was necessary."

Although some authorities on zoning believed that this rebuff might have been avoided by earlier adoption of the comprehensive enabling act, all seemed to agree that this last decision was the knell to zoning under the existing constitution. The road to a constitutional amendment seemed very rough. Only one state, Massachusetts, had ever

[1] 98 N. J. L. 712; 121 Atl. 783 (1923).

[2] 99 N. J. L. 389; 125 Atl. 121 (1924).

[3] —N. J.—; 130 Atl. 635 (1925).

passed a constitutional amendment authorizing zoning, and one other, Louisiana, had included such a clause in her new constitution. Moreover, New Jersey had been exceptionally slow to adopt constitutional changes of any sort. But steps were taken to secure the change and on September 20, 1927, the following amendment received the approval of the people of the state: "The legislature may enact general laws under which municipalities other than counties may adopt zoning ordinances limiting and restricting to specified districts and regulating therein buildings and structures according to their construction, and the nature and extent of their use, and the exercise of such authority shall be deemed to be within the police power of the state. Such laws shall be subject to repeal or alteration by the legislature."

It was the only successful proposed amendment out of five submitted at the time. The Bulletin of the New Jersey State League of Municipalities says of the amendment: "New Jersey is regarded as ultra-conservative in amending its constitution. During 51 years 21 amendments have been voted on at five elections. Only two of these have been adopted— and these by narrow margins —and 19 decisively defeated. Only on two occasions in 83 years has the New Jersey constitution been amended. The zoning amendment to the constitution was carried by more than 200,000 majority, the greatest in our history, and was carried in 19 out of the 21 counties."

The amendment adopted clears the way for re-enactment of the State enabling act with the assurance that the power delegated by the State to the municipal governments is specifically recognized and approved by the highest law of the State. The action of the voters not only opens a way for the continuation of zoning in New Jersey, but it is also a pleasing commendation of zoning in a state where this form of regulation has long been on trial.

COLEMAN WOODBURY

AMENDMENT OF EXCESS CONDEMNATION LAW OF NEW YORK CITY

LAST November the people of New York City added another section to the laws of the city which deal directly or indirectly with housing. In form, the law which received the approval of the voters merely provides that the restrictions in the city charter limiting leases of city land to a term of 10 years with one renewal shall not apply to land acquired through excess condemnation.

The text of the law reads: "Whenever additional real property is acquired by the city in excess condemnation proceedings pursuant to the provisions of Sec. 970-A, such additional real property may be leased by the city, acting through the board of commissioners of the sinking fund, for housing purposes (including stores on the street level) for such term as the board of estimate and apportionment may determine; and the provisions of Sec. 205, or of any other section, limiting the term of leases by the city to a different period, and requiring appraisal shall not apply to such a lease for such purposes."

This section is the latest addition to

the excess condemnation legislation of the city. The amendment to the state constitution authorizing excess condemnation was first passed by the legislature in 1909 but failed to meet the approval of the voters. When it was again submitted by the legislature in 1913, it survived the popular referendum; and in 1916 an amendment to the Greater New York charter specifically authorized excess condemnation by the proper local authorities. But the operation of the law for housing reform purposes was hindered by the general provision (Section 205 of the city charter) checking the length of leases.

With this restriction removed, the board of estimate is considering the leasing of land abutting on Allen Street after it is widened on terms which will limit the rental of the tenements to be erected thereon to $8 a room. This figure is considerably below the maximum set by the State Housing Law of 1926 for housing projects developed by public limited-dividend housing companies, i. e., those allowed by law to exercise the power of eminent domain. Rents for dwellings built under this law are limited to $12.50 per room per month in Manhattan, $11 in Brooklyn and the Bronx, $10 in Queens and Richmond and in cities of the first class in the State and $9 elsewhere.

This proposal is arousing considerable controversy, the main contention of those opposed being that it is an undesirable subsidy by the city to the housing of a certain class of the community. The position of the New York officials is perhaps best summarized in a resolution adopted in July, 1927, by the board of estimate and apportionment which said in part—

"Whereas it has been found through years of endless effort and public discussion that the gigantic work of rebuilding these unsanitary and unlivable areas of the city cannot be done entirely by private initiative or interest, however philanthropic, and that public, community and governmental measures should be invoked to begin a comprehensive cleaning up of the unlivable housing conditions described in exhaustive reports made upon the subject; . . .

"Whereas one of the purposes of excess condemnation . . . is to permit the elimination of slum areas and the improvement generally of housing conditions by enabling the city, in connection with the widening or laying out of streets and parks, to condemn abutting property suitable for building sites, which the city may then lease to private persons and corporations for long terms on conditions governing the construction and renting by such persons and corporations of the homes constructed upon building sites so acquired by the city.

"Whereas excess condemnation has been employed with conspicuous success in Europe, notably in London and Brussels, for rehabilitation of congested areas: Now, therefore, be it

"Resolved, That it is the sense of this board that excess condemnation should be employed by the city when making public improvements in congested areas for the purpose of eliminating so-called slum districts and promoting housing conditions."

COLEMAN WOODBURY

BOOK REVIEWS

Riegel, Robert, and Doubman, J. Russell. THE BUILDING AND LOAN ASSOCIATION, *New York: John Wiley & Sons, Inc., 1927. pp. viii, 320. $3.*

The flood of works dealing with various phases of business activity has been so great in recent years that authors have felt obliged to give some justification for the appearance of a new treatise. In this case the authors' justification is best expressed in their own words: "Although building and loan associations are universally recognized as economic institutions of great social value and nearly ten million persons are financially interested therein, the readily accessible literature on the subject is not extensive. No apology, therefore, is necessary for a book describing a form of economic organization which controls five and one-half thousand directors and officers, and which operates in every state."

The authors' aim was to present the leading features of building and loan operations with greater emphasis on the accounting and legal aspects of the business than has been contained in previous general treatises on building and loan associations. The first five chapters deal with the organization, membership, directors and officers, and such problems as withdrawals, maturities, and transfers. The outstanding contribution in this first part of the book is found in Chapter III which outlines the solicitation of members through various types of advertising.

Chapters VI and VII deal with loan procedure and carefully trace the mechanics of lending, after discussing security, premiums, and loan costs. The analysis of loan procedure is based upon the existence of a guarantee title company, as well as upon the smaller building and loan association which is typical of Pennsylvania. The discussion should have included comment on the loan procedure in communities which still depend upon the abstract system in conveyancing and in which the building and loan association handles all of its own title examination, preparation of papers, and closing of loans. Although lending for construction is mentioned in one paragraph, the writers neglect full discussion of the problems involved in this important phase of building and loan activity.

Chapters VIII, IX and X portray accounting procedure for building and loan associations, including material on the annual report, distribution of profits, auditing, and examinations. This portion of the treatise represents the most original material which these authors have contributed and should be invaluable to building and loan executives, especially in new associations.

The concluding chapters contain a careful analysis of state laws and regulation methods. The authors point out the marked divergence in the statutes and administrative machinery of the various states. They recommend that some system of codification be evolved which would call attention to the absence of legislation on important phases of the business in many states. Such codification or standardization of statutes would also facilitate the elimination of those differences which do not rest on peculiar local conditions. The discussion of the relation of the associations to the states ends with a chapter on taxation, in which careful analysis is made of the methods and amounts of taxes in the various states, as well as the Federal imposts and exemptions. Chapter XIII

deals with special features, such as insurance, deposits, investment developments, and special types of loans other than the typical amortized loan.

The authors have scrupulously avoided the "unscientific, propaganda type of material" which has characterized some of the previous works in this field. Because of its careful organization and clear exposition, the book is more suitable for class room purposes or as a working manual for building and loan officials than have been previous publications. Also the textual material is amply supplemented by tables, forms (accounting and otherwise), and graphic illustrations of procedure. The excessive annotation of the text evidences the large amount of research which the authors have completed in attempting to deal with the whole field. Provision has been made for the varied conditions and practices obtaining in the separate states by the use of numerous foot-notes. The authors show great familiarity with the Pennsylvania mode of operation and consequently some of the description does not apply to operation in other states. Dr. Riegel and Dr. Doubman have performed a valuable and worthwhile task in bringing together and evaluating such a comprehensive array of facts concerning building and loan operation. Throughout the text they preserve remarkable continuity and their painstaking attention to details marks their contribution as a most important addition to the inadequate stock of building loan literature.

H. Morton Bodfish

Pollock W. W. and Scholz, K. W. H. The Science and Practice of Urban Land Valuation, *Philadelphia: The Manufacturers' Appraisal Company, 1926, pp. viii, 315. $5.*

A body of principles comprising the science of urban land valuation is gradually emerging out of everyday practice. The problems confronting all who are concerned with urban land values are so numerous and so perplexing that any contribution to the subject is sure to attract attention.

The work of Messrs. Pollock and Scholz does not claim to be either novel or original. In the opening paragraph of the Introductory Preface the authors say: "This work, as announced on the title page, is an exposition of the Somers Unit System of Land Valuation, as devised by the late William A. Somers." The book consists of three parts: I, Principles of Land Valuation; II, Practice of Land Valuation; and III, Significance of Scientific Land Valuation.

After a few cursory remarks on the Nature and Characteristics of Land (Chapter I), the authors proceed in several succeeding chapters to attack as inadequate some of the usually accepted evidences of urban land values. Market prices are condemned on the ground that "nearly all transactions in land may be fairly classified as abnormal, if by normality of price one means a fair or normal exchange value." The willing-buyer-willing-seller theory ascribed to the courts as a formula for determining values is discarded because "as a matter of experience, the willing buyer and willing seller seldom if ever meet . . . We search long and earnestly before we find those entirely willing persons performing in actual practice this theoretically happy and willing function." The judgments of appraisers are discounted with the argument that their estimates are merely opinions as to "what a tract of land would sell for after due notice in a competitive market." Capitalizing net income is dismissed as an impracticable method of estimating land values because "the failure to differentiate clearly between income from land and income

from improvements makes it impossible to ascertain accurately in all cases the exact income yielded by a certain piece of land."

After the summary outlawing of these and other widely employed methods of estimating land values, readers whose knowledge of these methods is limited to the expositions set forth by the authors, must feel that both the practice and the science of land valuation are primitive.

But how then *are* we to find that elusive thing we call value? According to the authors, the essence of land values is to be found only in "community opinions as to relative land values." Just how this "community opinion" is to be ascertained is somewhat difficult to determine from the text. The answer is expressed in one of Mr. Somers' maxims: "To ascertain the value of anything, ask one who knows. His answer will be what he thinks it is worth based upon what others think it is worth." Who are really competent to express the "community opinion" on values? The reader is told that "notwithstanding the fact that the giving of testimony is usually limited by the courts to dealers in land, expert appraisers, assessors, and so-called authorities on land values, *a sufficient qualification to testify exists if the witness is a resident or property owner in the community.*" This does not appear to be very helpful to a perplexed appraiser.

The greater portion of the book is devoted to an elaborate exposition of the mechanics of applying the Somers' system to various types of lots. The basis of this system, as stated by the authors, is as follows: (1) Community expression of opinion (or individual opinion based upon an interpretation of community opinion) of the relative values of streets and parts of streets and highways; (2) Expression of such opinion in terms of prices of definite units of quantity, with reference to the primary external factor of value, single-street accessibility; (3) Recording of community or individual opinion in terms of prices of unit quantities on unit-value maps; (4) Computation by the use of depth percentages, based upon the observation that the value of each increment to the depth of a site tends to decrease as the depth increases; (5) Computation or estimation of other external factors of value, individually and separately, based on careful observation of the effect of these factors upon the value of each unit of area of a site; (6) Computing and recording, on lot and block maps and on permanent record cards, the valuations of individual sites.

The contribution of the Somers system consists of a scale by which to assign diminishing values to various portions of lots depending on the depth to which the lot extends from the street. This principle is one which is well recognized by competent appraisers where it is applicable. In certain types of properties, however, the principle clearly does not apply. Certain uses of property are of such a nature that 10 additional feet at the rear of the lot are as important as any other portion of the lot. Moreover, sites used by large apartment buildings, for example, depend less upon street frontage than upon the size and shape of the site and surrounding features. The attempt, therefore, to make a universal application of the Somers principle to the exclusion of other well-defined methods of estimating value weakens rather than strengthens the authors' case for the Somers system.

ARTHUR J. MERTZKE

BOOK NOTICES

Schafer, Joseph. FOUR WISCONSIN COUNTIES, PRAIRIE AND FOREST. Wisconsin Domesday Book, General Studies II, *Madison: State Historical Society* (*1927*). *pp. viii, 429.*

This work is "General Studies Vol. II" of the *Wisconsin Domesday Book*, the first one being "Town Studies I" which is devoted to a somewhat similar treatment of 23 scattered towns. In this book the author has studied a compact area consisting of four counties in the southeastern corner of Wisconsin—Kenosha, Racine, Milwaukee and Ozaukee—all of them bordering on Lake Michigan. He describes the physical features, the pre-settlement history, and the settlement by the agricultural elements. The agricultural, political, social and educational history occupies the main part of the book; it closes with chapters on population changes and recent immigration. Almost 100 pages of appendix are devoted to maps and tables illustrating and substantiating the author's thesis.

The land economist will find many interesting features in this treatment of the four counties. The chapter on the selection of land is of special interest to the reader who wishes to test Henry C. Carey's theory of the order of land selection. The two southern counties, Kenosha and Racine, are in marked contrast to Milwaukee and Ozaukee. The former lie almost exclusively in the prairie region with its oak openings interspersed with swamps and low meadows. The two northern counties were heavily forested, lying in the noted maple forest of eastern Wisconsin. The prairie counties were settled chiefly by native Americans from New York and New England, the forest counties by foreign-born among whom the Germans predominated. Other nationalities were the Irish, Dutch and Scandinavians in smaller numbers.

The differences in physical environment and in the settlers had distinct effects upon the development of the two regions. The Americans were the first settlers and chose the prairies because of the ease with which farms could be created. But it took more ready capital to start farming here than in the forests. Building materials and fencing had to be purchased and wells dug, because springs and streams are less plentiful than in the forests. The Germans settled in the forests because they were anxious to be near adequate transportation. Since they came somewhat later, they had to be satisfied with the heavier soils; being poor people, they found the forests with abundant building material and water supplies better suited to their needs than the prairies.

The two areas are also different in their political and social history. The two southern counties swung to the Republican party long before the German counties. The Democratic party had favored the immigrants and was anti-war; this feeling was shared by the Germans, many of whom had left the Fatherland to avoid military duty. Education also took a different course in the two areas. The New Englanders, accustomed to local autonomy in education, soon had a school system under way. The Germans with less economic prosperity and less experience in democracy made slower progress and had the language difficulty to overcome. The author also discusses the influence of different customs and institutions, such as music, Sunday observances, and saloons, for instance, on the progress of the two areas.

On the whole, the book is a very interesting study of two contrasted areas differing in physical and social environments, an amplification of the author's "The Yankee and the Teuton in Wisconsin" in *The Wisconsin Magazine of History* (December, 1922 and March, 1923). G. S. WEHRWEIN

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